KOECKER'S

ESSAY ON THE

DISEASES OF THE JAWS

BY

J. B. MITCHELL, M.D.

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AND

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BY

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NEW EDITION, WITH

COPIOUS NOTES AND AN APPENDIX,

CONTAINING

TABLES OF UPWARDS OF THREE HUNDRED CASES.

BY

J. B. MITCHELL, M.D.,

SURGEON-DENTIST.

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TO

JOHN BURNS, M.D., F.R.S.,

REGIUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF GLASGOW, ETC., ETC.

IN ADMIRATION OF

HIS LABOURS IN VARIOUS DEPARTMENTS OF MEDICAL SCIENCE,

HIS HIGH PROFESSIONAL CHARACTER,

AND

PRIVATE WORTH;

AND IN GRATEFUL ACKNOWLEDGMENT OF THE LASTING ADVANTAGES DERIVED

FROM HIS ZEAL AND TALENTS AS A TEACHER,

This Essay,

WITH EVERY SENTIMENT OF ESTEEM AND RESPECT,

IS INSCRIBED,

BY HIS FORMER PUPIL AND OBEDIENT HUMBLE SERVANT,

J. B. MITCHELL.

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AUTHOR'S PREFACE.

THE publication of the present Essay, has, for various reasons, been considerably delayed, and it is not without some anxiety that I at length venture to offer it to public notice.

I am well aware of the difficulties with which the foreigner has to contend in any country, as a writer, more especially when his opinions may be supposed to aim at novelty or originality; and, notwithstanding the flattering notices which my "Principles of Dental Surgery" received from most of the guardians of the healing art—the medical and surgical journalists of this country—I am not the less diffident in my present attempt, as it is my most earnest wish to retain their good opinion, by making myself useful to humanity and the profession, as far as my feeble powers will permit.

In publishing this Essay, I may be accused of a presumptuous attempt to treat of a subject which does not belong to my particular province; this, I trust, however, will be deemed erroneous, when it is considered that, although in their later and more complicated stages the maladies of the jaws require the united aid of general surgery and medicine, they strictly, in their earlier forms, belong to the practice of dentistry, and never would require the assistance of the former, if the latter were judiciously afforded at the proper period.

There is, moreover, considerable difficulty in deciding at what period the exclusive treatment of the teeth becomes insufficient, and the time when the assistance of

the surgeon is indispensably required; an inconvenience which can only be removed by affording all branches of the healing art the means of acquiring the most comprehensive views of the history, nature, and causes of the diseases in question.

That the dental surgeon has the best, and most extensive practical opportunities of observing and watching these maladies through their different stages can scarcely be denied; and he may, therefore, fairly be regarded as not unqualified to give such a complete account of his pathological and practical observations, as may be most useful in their elucidation. These reasons, combined with the nature and intricacy of the subject, will, I trust, form a sufficient apology not only for the liberty I have taken in publishing the Essay, but also for having treated the subject in a more extensive manner than, under other circumstances, might appear necessary.

Many of the remarks which it comprises are the result of repeated and unprejudiced observation and reflection; and it is the conviction I entertain of their practical utility, which induces me to hope that they will not be deemed undeserving of the notice of the medical profession at large. Under this impression, I feel it my duty no longer to delay their publication, and whatever may be the literary imperfection of my work, I doubt not it will meet with every indulgence due to the peculiar circumstances of its author, assured as I am, that the best and purest intentions can never be misinterpreted by the liberal and enlightened British public, so justly celebrated for its philanthropy and good feelings towards every citizen of the world.

Conduit Street, Hanover Square.

EDITOR'S PREFACE.

I HAVE been induced to publish a new edition of this work, which first appeared in 1828, by the fact, that, at the present time, it is all but unknown to the medical profession. The want of the peculiar talent for keeping himself prominently before the public, on the part of the author; and on the part of the profession, a strong feeling in favour of the knife, and the novel operation that was first introduced about the time of the publication of this Essay, in the treatment of the diseases of the jaws, have operated powerfully against the realisation of the author's wishes. The Essay has, moreover, long been out of print, and thus, now that the rage for the amputation of the maxillæ has somewhat subsided, and sounder views of the nature and causes of the diseases in question begin to prevail, it is no longer to be procured.

It is difficult to say what influence the views advanced by the author, so many years ago, have had in modifying the opinions of the profession. If the

change, which, to a certain extent, is observable, has occurred independently of the promulgation of Mr. Koecker's doctrines, it cannot but be regarded as a strong corroboration of their truth; but, at the same time, without in the least detracting from his claims as the original indicator of the true pathology of the diseases of the jaws.

That such an alteration of opinion has been going on in the profession, I trust is sufficiently shown in the notes that I have added to the original work; while the very limited extent to which the practical deductions, in respect to curative treatment, have been carried, proves that there is still a want to be supplied. Indeed, Sir Benjamin Brodie, in his admirable clinical lecture on this subject, to which I have had occasion frequently to refer, acknowledges, that "No clear account of the diseases of the antrum is given by surgical writers." If this be true of one particular cavity of the maxillæ, it is much more so in regard to the diseases of the jaws in general.

Prior to the publication of this Essay, the diseases of the maxillary bones had not been treated in a comprehensive manner by any writer—the cavity of the upper jaw having alone received attention. On the affections of the antrum maxillare many works have, indeed, appeared—from the writings of Deschamps and Bordenave down to the "Lettre Chirurgicale" of M. Gensoul, and Dr.

Harris's "Dissertation on the Diseases of the Maxillary Sinus;"—but the very fact of the affections of the jaws being regarded by those authors from so narrow a point of view, implies a misconception of their true pathology. Unfortunately, this limited view of the diseases of the osseous structure of the jaws, is the one which has generally been taken by our most eminent medical authorities, who still continue to look upon the affections of the antrum as peculiar to that cavity. Nor is this the case among systematic medical and surgical writers only, but even such accurate and close observers as Dr. Walshe have fallen into the error of entirely overlooking the lower jaw, and its liability to similar affections with the upper. The Table, however, which I have given in the note to page 14, sets this matter at rest. Nothing could be more satisfactory than the results which it exhibits—agreeing, as they do, most perfectly with what might have been expected from a consideration of the individual peculiarities of the maxillary bones. We see by that Table, that of the two jaws, the upper is the more liable to suppuration—on account, probably, of its greater vascularity, the under to necrosis—owing, doubtless, to its being more isolated and less abundantly supplied with vessels; and that both jaws are almost equally prone to tumours and growths, which, when of a malignant nature, are quite as frequent in the one as in the other—a circumstance which arises from the cha-

racter of such tumours being derived from constitutional causes.

Subsequently, however, several treatises of a more comprehensive character have appeared. In 1836 was published Mr. Liston's very valuable paper, "On the Tumours of the Mouth and Jaws," in the "Medico-Chirurgical Transactions;" in 1844 Dr. O'Shaughnessey brought out, at Calcutta, his "Essay on the Diseases of the Jaws;" and in 1842 was produced Mr. Compton's successful Jacksonian Prize-Essay, "On the Injuries and Diseases of the Maxillary Bones." Dr. O'Shaughnessey's work has hardly any pretensions to be more than a manual to the operation of amputation of the jaws, and, with the single exception of the remark that the fibro-cartilaginous tumours do not appear to originate so frequently from carious teeth, in India as in this country, it leaves the "unassignable causes" exactly as it found them. The chief merit of Mr. Compton's Essay consists in its being an elaborate compilation of the various notices these affections have received from surgical writers; and, as such, it records many important facts. But Mr. Liston's paper is one of a very different character. In that treatise the author throws much light on the local causes of the diseases of the maxillæ, and, while contending that the surgical operations for the extirpation of the tumours of these parts are best performed by incisions through the sound tissues beyond the limits of the disease, he

clearly proves that such operations ought not to be indiscriminately had recourse to, as had previously been the practice. Nevertheless, it appears to me that he overlooks too much the effect of the curative plan of treatment directed to the complicated organs of the mouth, and considering the comparatively small number of cases demanding amputation, that he rather overrates the importance of that operation.

The writers on dental surgery have not failed to point out the morbid effects of the diseases of the teeth, on the osseous structure of the jaws; but they have been content to grapple with these effects in one or two forms only. "Abscess of the Antrum," "Parulis, or Gum-boil," and "Epulis"—the simplest form of the sarcomatous tumour—are sometimes mentioned in Systems of Dental Surgery; but uniformly as distinct primary diseases, instead of symptomatic affections—all equally referrible to the same causes, namely, the idiopathic diseases of the teeth and sockets.

As in the natural sciences the tracing of analogies between individuals, and the referring of them to known species, is more beneficial to natural history than the far more easy efforts at dissociation and segragation—so in medical science, the multiplying of specific diseases, without regard to causes, is rather an impediment than an assistance to the advancement of practical medicine. A vesical calculus may give rise to various affections

of the neighbouring parts, and connected organs; but, in an ætiological point of view, the disease, whatever the symptoms, is still calculus, and the sole correct treatment consists in the removal of the lithic deposit. And thus it is with the diseases of the jaws: in their ætiology they are identic, and, on this identity, is founded their only successful curative treatment;—a treatment for which the practice of my partner, Mr. Koecker, has long been so remarkable.

The same pathological principles have been applied by that gentleman to the treatment of the diseases of the teeth themselves, and with an equally favourable result. Indeed, the usual clumsy attempts at palliation, and all the various modes of temporising, acting on the general principles of surgery, he has entirely discarded, and, as might have been expected, dental surgery, instead of being the most uncertain and unsatisfactory of all the departments of the healing art, has proved, in his hands, one of the most satisfactory and unerring branches of surgery.

Those principles, so happily conceived and successfully carried out by Mr. Koecker, it will be my constant object to act up to, so that his practice may be perpetuated, even after he has withdrawn from the active discharge of the duties of his profession, which he has long so ably and honourably exercised.

To the "Essay on the Diseases of the Jaws," as it

now appears, I may apply the words of the distinguished individual to whom I have the honour of inscribing it:—"I have collected with care the different cases which have been made public, as well as my own private observations. To these I have added the opinions and advices given by others, in so far as they appeared founded on facts, and supported by experience. From the whole, I have deduced, in the different parts of my subject, both the symptoms and the practice."

I have only further to remark, that for the few verbal alterations which I have thought it necessary to make in the text, I am, of course, responsible, and not the learned and distinguished author.

5, Conduit Street, Hanover Square,
October, 1847.

"Should you perceive truths to be important, make them motives of action; let them serve as springs to your conduct. Many persons acknowledge truth with apathy; they assent to it, but it produces no further effect on their minds. Truths, however, are of importance in proportion as they admit of inferences which ought to have an influence on our conduct; and if we neglect to draw those inferences, or act in conformity to them, we fail in essential duties."—*Sir William Blizard, cited in Abernethy's Anatomical Lectures.*

AN ESSAY

ON

THE DISEASES OF THE JAWS.

PRELIMINARY REMARKS.

THE maladies of the maxillary bones are occasionally of a very appalling nature, and may be considered as constituting some of the most distressing diseases to which the human frame is liable.

They are frequently regarded as incurable; and, consequently, too often neglected at their commencement, or improperly treated in their advanced stages; and are thus suffered to proceed in their destructive progress towards a painful and fatal termination.

It is probable, that these unfortunate results are in many instances attributable to erroneous views of the nature of the diseased structures; as an instance of this, it may be stated, that Mr. John Hunter, that illustrious pathologist, when treating of the disease of the maxillary antrum, in his "Natural History of the Teeth," part i. page 44, being probably misled by his well known theory of the inorganisation of the teeth, inclines to the opinion that these diseases originate from an obliteration of the duct leading to the nose, whereas, accurate observation shows that the closure of the opening in question is the consequence, and not the cause, of the inflammation of the antrum.* That Mr.

* Meckel found the maxillary sinuses in an old woman entirely shut towards the nose, *without any morbid alteration of the lining membrane being present*, notwithstanding that their surfaces were moistened as usual.

Hunter's opinion is erroneous, is further proved by the fact, that a similar disease occasionally effects the lower jaw, with respect to which he is entirely silent.

His proposed plan of perforating the partition between the antrum and the nose, as well as of opening the inside of the lip, is not only entirely useless in a curative point of view, but likely to increase the disease; and very probably such treatment would never have been successful, even in the first stage of the disease, had it not been combined with better remedies, which, however, from some unhappy prejudice, or erroneous principle, were considered as secondary means, and seldom adopted until the patient had previously been subjected to painful and unnecessary operations.

Mr. Fox regards the disease in the same light as Mr. Hunter; but, as he has taken a more extensive view of the subject, his observations require fuller consideration.

In his "Natural History, &c., of the Teeth," part ii., page 124, he says, "Inflammation in the antrum is often occasioned by diseases of the teeth, but it also occurs when the teeth are quite sound. Sometimes in examining the prepared bones of the head, one or more fangs of the large molares may be found passing into the cavity. In such a case, inflammation excited by a diseased tooth is speedily communicated to the membrane lining the cavity and causes suppuration."

These views, which constitute the ground-work of his surgical treatment of such diseases, are unquestionably erroneous, which is the more surprising when we consider that they are contradictory to his own theory of the vitality of the teeth.

The fangs of the large grinders, or, indeed, of any other tooth, never enter into the cavity of the jaw in the living subject, so long as they are possessed of vitality. Such appearances in anatomical preparations, result from the bony structure surrounding the points of these fangs having been destroyed by the boiling, maceration, or other processes, to which the maxillæ had been subjected in order to rid them of their soft parts.

Whenever the fangs have passed into the cavity of the antrum, previous to death, they will always, together with their respective bodies, be found to have lost their vitality, the connexion between

them and the dental artery and nerve, the means of supporting that vitality having been previously lost;* in this state the irritation of the dead fangs produces an absorption of the osseous structure of the jaw immediately surrounding them; and occasionally inflammation and suppuration take place in what may be regarded as comparatively an early period of the disease.

Mr. Fox advances no direct opinion regarding these affections as they occur in the under jaw, although he must have been well aware of the different structure of the superior and inferior maxillary bones, as well as of the different formation of the under and upper teeth. Several of the cases which he relates are, however, affections of the under maxilla, a fact which virtually proves his admission that these affections are similar.

He believes with Mr. Hunter, that in some instances, the disease may be produced by the obliteration of the duct leading from the nose to the maxillary cavity, even when the teeth are perfectly sound, but advances no satisfactory reason or proof to establish such an opinion. For my own part, I am perfectly convinced, that such an opinion is not consonant with fact, and that these diseases are almost invariably brought on by some previous disease or disorder of the teeth, or of the parts immediately related to them.† As far as my own experience extends, I have never failed, on a minute and careful investigation of the original symptoms, to find this opinion of the causes of the disease satisfactorily confirmed.

All the various affections of the jaw which Mr. Fox has either seen or related, and of which he gives more or less perfect engravings and histories, may be presumed to have taken their origin

* The anatomy of the part does not admit of the fangs of the teeth penetrating into the cavity of the maxillary sinus, except as the result of disease. The dental nerves and alveolar arteries pass into the teeth *directly from the substance of the bone.* Did the roots of the teeth penetrate into the antrum, the arterial and nervous twigs which supply them, would in the first place have to enter that sinus, and then, covered only by the mucous membrane, make their way into the foramina of the teeth *within the cavity.*

† The effects of external injury form, of course, exceptions to this statement, although it is disease arising *spontaneously* in the lining membrane of the antrum that the author has in view.

from some disordered state of the teeth, or from the local irritation produced by dead teeth or roots, or from disease and irregularity in the parts related to them.

The treatment recommended by Mr. Fox, like that of Mr. Hunter, will always be inefficient unless the disease is in its incipient state, and the tooth, which he recommends to be extracted, the exclusive or principal exciting cause; in this case, that operation, which is the most, and sometimes the only useful part of the whole treatment, may afford nature the necessary assistance to affect a cure of the malady, notwithstanding the counteractions produced by pernicious operations and remedies.

These are, however, instances of rare occurrence. In a more advanced state the extraction of the tooth is merely palliative, and the parts remain predisposed to a dangerous relapse. Hence, the frequent recurrence of the disease after surgical treatment; hence, the reluctance of surgeons and dentists to interfere in such cases; and hence the general neglect of proper treatment in their early stages.

At page 126 of the essay already referred to, Mr. Fox says, "When the matter has been discharged, the object must be to restore the parts to their former condition; with this view, a solution of tincture of myrrh is to be frequently injected with a syringe through the opening."

How far the morbid action of so formidable a disease can be changed to a healthy one, and parts so peculiarly constituted and affected, restored to their original state, merely by the use of a syringe and a solution of tincture of myrrh; and this without removing the more active, local, chemical, and mechanical exciting causes of this morbid action, may be readily conceived, without any further observation on my part.

Indeed, not only all the cases related by Mr. Fox, which by a timely and judicious dental treatment might probably have been brought to a successful termination, but also the vague modes of treatment generally recommended by various writers, furnish proofs of the imperfect knowledge which at present exists with respect to them; nor can we fail to regret the inactive manner in

which dental surgery stands by, and looks on at the heart-rending sufferings of such of our fellow-creatures as become the victims of this cruel malady.

In the case of Mr. W., at page 130, Mr. Fox states, that for nearly five years, the disease was palliated by a repeated use of the lancet, under the direction of Mr. Cline; the unfortunate patient, however, was at length gradually destroyed by a malady, which, I doubt not, might have been cured in one fourth of that time, by a proper dental treatment of the various parts involved in the disease. I must not, however, be misunderstood; for it is not my intention to censure either the surgeon or the dentist, as both of them adopted and adhered to the practice usual on such occasions; it is the inefficacy of the practice that I wish to expose, and of this perhaps no better proof could be produced than the fact, that under the direction of one of the most eminent practical surgeons and dentists of this country, it was totally unsuccessful. I may, however, be permitted to express my opinion, that the dentist who would be deemed deserving of the confidence of society, ought, in all matters which belong to his particular profession, to be directed by the competence of his own judgment, grounded upon a full and scientific knowledge of the principles of his art; and it can scarcely be denied that the management of the diseases of the maxillæ would be most advantageously entrusted, in all their stages, more or less to the care of one thus qualified.*

* It would be unreasonable to expect that the mere tooth-drawer or mechanical dentist should have a proper understanding of the principles of the treatment of these diseases, and the pathological condition of the parts involved in them. Indeed, considering the complicated structure and sympathies of these parts, it is surprising that the general treatment of the teeth, and their immediate connexions, has been so exclusively given up to men ignorant alike of all the branches of medical science. From the fashionable dentist, who cements dead teeth, and cultivates "*useful stumps*," to the advertising impostor, who, in defiance of all principle, openly declares that he inserts artificial teeth without attending to the health of the mouth, and without extracting dead stumps and roots, how few dentists are there who treat the teeth as living bodies! Yet, this fact of the vitality of the teeth, is the foundation on which rests all proper treatment of the mouth. Even medical men, in general, are not sufficiently alive to this main fact of dental surgery; and it would be well, if, instead of sanctioning the numerous means employed by dentists for hastening the destruction of decayed teeth, under the plea of curing the tooth-ache, they discountenanced all modes of treatment of the teeth, except such as are consonant with the principles of general pathology. How utterly at variance are all those practices, derived, as

It is, moreover, but just to state, that it is impossible for the surgeon, who has not had the opportunity of making dental surgery his most particular study, to be capable of observing these maladies, and watching them with the necessary accuracy during a gradual and protracted progress, generally occupying a period of from five to ten, and sometimes even twenty-five or thirty years, before they arrive at their ultimate, and often fatal termination.* This difficulty may, probably, have given origin to the very incorrect name of "Diseases of the Maxillary Antrum;" and to it also may be attributed the common and erroneous belief of their spontaneous origin in the cavity or mucous membrane lining the cavity of the jaw.

Nor, without this particular attention, is it possible for the general surgeon to become sufficiently acquainted with the curative effects of any system of treatment; hence arises, not only the erroneous supposition of the incurability, and the consequent passive treatment of the diseases in question, but also the determination to

they are, from that school which regarded the teeth as non-vital bodies, with our actual knowledge of the structure of these organs, which are now acknowledged to be so highly organised as to warrant Dr. Graves in styling them "the fingers of the mouth," in allusion to their peculiar and exquisite sensibility.

* The same careful, minute, and continued attention, is necessary in studying the idiopathic affections of the teeth themselves, the recognition of whose causes requires considerable experience. "Idiopathic diseases," to quote from another of the author's works, "while they only affect parts of so limited a nature as the lining membrane of a tooth, are capable of almost overwhelming the entire system by nervous irritation, so as even to produce actual madness, but are, nevertheless, for the most part, to be detected only by dint of a most minute acquaintance with the pathology of the parts immediately concerned." (See Dr. Rush's "Medical Inquiries and Observations upon the Diseases of the Mind," page 35.)

"The difficulties here supposed are owing to the great variety of circumstances accompanying the diseases of the teeth, namely, the different aspects which they assume; the manifold effects and symptoms produced by them; the comparatively small and hidden parts and surfaces, which the idiopathic maladies occupy, on the one hand, and the greater or smaller distance, and the greater extent of the parts and their surfaces, which are sympathetically affected, on the other; the sudden changes of the symptomatic affections from one place to another, the frequent absence of pain or the comparatively slight pain accompanying the idiopathic local malady, and the consequently greater pain accompanying the symptomatic affection, together with the frequent translations of the nervous and rheumatic-like pains from the parts primarily diseased to those which are secondarily affected, and *vice versâ* :—all are of such a deceptive nature as to be not a little calculated to mislead any medical practitioner, who has not very just notions on the subject."—"Koecker's Principles of Dental Surgery," page 105.

attempt their cure at every hazard, and with the greatest sacrifices, by such means as are within the comprehensive reach of general surgery.

The baneful effects which result from the present imperfect pathology of the teeth and their relative parts, are particularly evinced by the following most extraordinary instance of severe treatment, extracted verbatim from the "Medico Chirurgical Review," for July, 1826, p. 288.

"Dr. Regnoli, of Forli, relates a case, in which a fungoid affection of the maxilla and gums, was successfully treated by the removal of the alveolar process, of both jaws. The patient, a woman, thirty-five years of age, had had carious teeth from her infancy, and was almost constantly tormented with severe tooth-ache. She was, besides, subject to frequent erysipelas of the head and neck.

"Towards the close of 1824, she discovered a small tumour, behind the last molar tooth of the lower jaw on the right side. It soon ulcerated, and rapidly spread to the gums and alveoli of both jaws. These parts were much swollen, and considerably contracted the cavity of the mouth. The fungoid excrescences poured out blood on the slightest touch, and continually produced a thin and fetid discharge. The deformity was considerable, and the voice was altered. The limits of the disease were well defined, and the lymphatic system did not appear to be affected, but the patient experienced much pain, her countenance was dull and cachectic, she lost flesh, and had febrile exacerbations in the evening. In this state of things, the patient was admitted into the hospital at Pesaro, where, after having first performed the operation on the dead subject, Dr. Regnoli" [no doubt, after having divided both cheeks to a considerable extent at the angels of the mouth,] "removed the teeth and alveolar processes of both jaws, with the exception of the last molar tooth on the left side of the lower jaw, the socket of which appeared to be sound. From the situation of the parts, the saw could hardly be employed, hence, it was merely used to form a shallow groove in the most prominent parts of the bone, the separation of which was effected by means of a chisel and mallet. Actual cautery was applied to the bleeding vessels, and to such suspicious parts as were not accessible to the knife.

The lips of the external wound were brought together by three gold needles, and the twisted suture.

"The first day after the operation, the patient referred her pain to the throat, rather than to the parts which had been operated upon. She had severe head-ache, which was attributed in part to the shock given to the head by the strokes of the mallet, and to the division of the dental nerves. The needles were removed on the fifth day. On the fifteenth, seventeenth, and eighteenth, some portions of exfoliated bone were detached. On the nineteenth, the lips could be closed for the first time. By the twenty-third, all tumefaction had subsided, the voice was improved, the catamenia, which had been long absent, had re-appeared, and the other functions were in a natural state. On the thirtieth, the sole remaining tooth was removed, as it interfered with mastication. Five days later she left the hospital in good health. The lips fell in a little, especially the lower, but the deformity was very slight. The voice, which had not quite recovered itself, was daily improving.

"Dr. Regnoli concludes, that though the disease should return, the operation was still proper and necessary. Without it, he considers that death would have been inevitable, and he urges in its favour,—that it incurred but little danger—that the practice of Dupuytren and Vacca support it—and that the disease does not always return."

From the description of the above case, I have no hesitation in positively asserting, that the mere extraction of all dead roots, and such teeth as were loose, or suffering from complicated caries, would have been better calculated to effect an expeditious and radical cure, than the above extremely painful and destructive treatment.

To the same principle may also be fairly ascribed, the first introduction of the formidable operation of amputating a part, and sometimes even the whole of the affected jaw. This treatment, however, although creditable to its ingenious inventor, and justly conferring the greatest honour, not only upon him, but also upon every one who has skilfully performed so difficult an operation, is still only applicable to those cases in which the disease affects the

under maxilla; independently of this, it is in itself appalling, dangerous, and certain in many cases to prove of a fatal character; and even in its more successful instances, not unlikely to be followed by a total loss of future comfort.*

Although it is quite unnecessary to dwell upon the risk usually accompanying this operation, yet a peculiar danger to which it exposes the patient should not be passed unnoticed, namely, that of the retraction of the tongue by the glosso-pharyngei muscles, after having lost the counter-action of the geneo-glossi, in consequence of which, sudden death may ensue from the suspension of respiration. This fact, it would appear, was first pointed out by the German surgeons, who considered it a sufficient reason for abstaining from the operation, and M. Delpech has confirmed the

* At the time the above remarks were written, the operation of excision of the superior maxillary bone was hardly introduced; M. Gensoul's first operation, although performed so early as May, 1827, not being known in this country, and Mr. Lizar's first attempt, which was interrupted by hæmorrhage, having been made in December, 1827, only a few months previous to the publication of this essay. The excision of the inferior maxilla had been performed in 1812, by Baron Dupuytren, in 1821, by Dr. Mott, again, in 1824, by Baron Dupuytren, and, subsequently, by several other eminent surgeons; but was still looked upon as a novelty. Since then, however, every surgeon has become familiar with these operations, and, indeed, a few years ago the amputating of jaws had become quite a fashion. Mr. Liston, in his Paper on the Tumours of the Mouth, in the "Transactions of the Medical and Chirurgical Society," states, that, up to 1836, there were fifteen cases of excision of the upper jaw on record, with eleven deaths and four recoveries. This great amount of mortality was chiefly owing, as that gentleman has shown, to the malignant character of the cases operated on—a point of the greatest importance—first insisted on by Mr. Liston, from attention to which the surgeons of the present day have greatly reduced the rate of mortality; but it must be confessed, that they have thereby considerably limited the proportion of cases fit for operation, and consequently greatly swelled the lists of the hopeless and incurable. M. Wœnkner, in the "Med. Annal. von Heidelberg," for 1838, gives an account of the operations performed on the lower jaw up to that year. According to his statement, there were, from 1810 to 1830, sixty-one *resections* in the *continuity* of the bone; from 1793 to 1831, eighteen with disarticulation; and from 1831 to 1838, eighteen of both kinds. I am inclined to think, that among these ninety-seven cases of *resection*, are included many minor operations, which in this country would be styled excision of the *alveolar processes*. From the Catalogue of cases given in the Appendix, it will be seen that within the last twenty years the operation of the excision of the *body* of the maxillæ has been performed in the upper jaw at least fifty-eight times, and in the under jaw no fewer than seventy times. M. Wœnkner's statement, that of the eighteen patients operated on between 1810 and 1830, eleven recovered and five died, while of the eighteen submitted to excision, between 1831 and 1838 only two died, would go to prove the progressive limitation of the operation to non-malignant affections.

truth of it in a paper read before the Royal Academy of Sciences of Paris, Oct. 16, 1827. See the "Lancet," vol. i., p. 492, 1827—8.

Indeed, it is the intricacy of the maxillary diseases which has so frequently baffled the surgeon, and driven him from the golden middle course, to the pernicious extreme of either the most neglectful, or the most active treatment. Thus in former times, the surgeon having neglected to notice the causes of both the primary and secondary affections of the maxilla, either declined active treatment, or found himself disappointed, after repeated extirpations of spongy, sarcomatous, osteo-sarcomatous, and other excrescences, by a return of the disease; while the modern surgeon considers it a favourite *chef-d'œuvre* of his art to remove, at one operation, both the secondary and primary disease, as well as all their local causes, by the amputation of a part or the whole of the alveoli or the jaw.

The maladies of the maxillary bones, if not more common in England than on the continent of Europe and America, are, at all events, not unfrequently met with in this metropolis. As a proof of this, I must be permitted to observe, that I have seen many instances of this terrible disease, in almost all its different stages, during my short residence in London, not only in my own immediate practice, but in cases which have been placed under my care by medical friends.

In November, 1826, Mr. Lawrence was consulted by two individuals; one affected with the disease in its fistulous state in the right side of the upper, and the other in the left side of the under maxillary bone. They were cases of some years' standing, originally produced by dead stumps of teeth, and particularly aggravated at that time by other carious teeth, and a general diseased state of the mouth. Both were placed under my care by that gentleman, and cured by a complete removal of the causes of the disease.

Were it necessary, I might here relate many other cases of disease of the upper and under jaw, which entirely arose from diseases of the teeth, gums, and sockets, and were perfectly cured by dental treatment.

The successful result of such cases in my hands has not only

proved personally gratifying to myself, but leads me to assert, that, having directed my particular attention to such maladies for many years, and enjoyed ample opportunities of minutely observing them in every stage, so far from considering them incurable, I believe them to be as much within the influence of curative treatment as any of the disorders of the mouth. I beg to add, that should the result of my observations prove beneficial to humanity, I shall consider myself richly rewarded for the exertions I may have made to establish a proper mode of treating this destructive disease.

PHYSIOLOGICAL AND PATHOLOGICAL REMARKS ON THE JAWS.

THE maxillæ are subject to accidental injuries as well as to the morbid affections common to all other bones of the human frame. The latter form the proper subject of this essay. They must be regarded, with few exceptions, as the consequences of primary affections, either of the soft or of the osseous structures, connected with, or contiguous to, the maxillary bones.

When the primary disease affects the soft parts, the secondary effects upon the maxillæ are comparatively slight, and so little dangerous as to be rarely noticed. They will in general be removed by the curative powers of nature, or by common medical and surgical treatment, and as they seldom or never produce permanent diseases in the jaws, their consideration will not receive our further notice in the present essay.*

The particular structure, formation, and situation, however, as well as the physiological, physical, and mechanical functions of the jaw-bones, and the relation in which they stand with the contiguous osseous parts, not only render them peculiarly liable to be influenced by the various idiopathic diseases of the teeth and sockets, but frequently occasion them to suffer from those affec-

* Carcinomatous affections, however, when they attack the soft parts—as the glands and skin—in the neighbourhood of the jaws, sometimes involve secondarily, the osseous structure of the maxillary bones.

tions which are sympathetically excited by diseases of distant parts.*

* The complicated and important sympathies of the teeth and their contiguous parts, are universally recognised in the infant, whose delicate frame is so susceptible of that "undue action," (to use the words of Dr. Marshall Hall,) "which takes place in the fangs and sockets of the teeth in their whole extent, with their connexions, vascular, nervous, and membranous; the focus of which is not, as is generally imagined, the nerves of the mere gums, seated over the prominent parts of the teeth, but the nerves which may be emphatically termed *the nerves of the teeth themselves*—the nerves which enter into the very fangs and substance of the teeth."—("Lancet," May, 1844.) This action is, however, not confined to infant age, nor is it only excited by dentition, whether of the deciduous or permanent teeth, for the vascular, nervous, and membranous connexions of the teeth remain throughout life unimpaired.

Dr. Ashburner, in his work entitled "Dentition and some Coincident Disorders," has, with a masterly hand, laid open the complex pathology of dentition, and exhibited the extensive influence of the anormal growth of the teeth, in the production of many very serious affections both local and remote. But a much more common source of morbid action on the part of the teeth is furnished by their diseases. No medical writer that I am acquainted with, has more fully developed this subject than Dr. Rush, in his "Medical Inquiries." "When we consider," says this eminent authority, "how often the teeth are decayed, and how intimate the connexion of the mouth is with the whole system, I am disposed to believe they are often unsuspected causes of general and particularly of nervous diseases. When we add to the list of those diseases the morbid effects of the acrid and putrid matters which are sometimes discharged from carious teeth, or from ulcers in the gums created by them, also the influence which both have in preventing perfect mastication, and the connexion of that animal function with good health, I cannot help thinking that our success in the treatment of all chronic diseases would be very much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed. It is not necessary that they should be attended with pain, in order to produce diseases, for splinters, tumours, and other irritants often bring on diseases, and death, when they give no pain, and are unsuspected as causes of them." "The teeth," observes Mr. Lawrence, in one of his clinical lectures, "very often become a source of great irritation to the bone in which they are implanted, and are capable of exciting various painful sensations of a very distressing kind in the jaws and neighbouring parts; and you would hardly be aware at first how seriously the health of an individual may be affected, in consequence of a cause beginning in one small part of the body such as this."—("Medical Gazette," 1830, p. 456.) "From the presence of carious teeth or decayed portions of teeth," writes Mr. Liston, "many evils both local and general ensue, besides inflammation and abscess. They are frequently the cause—and the sole cause—of violent and continued headaches; of glandular swellings in the neck, terminating in or combined with abscess; of inflammation and enlargement of the tonsils, either chronic or acute; of ulcerations of the tongue or lips, often assuming a malignant action from continued irritation; of painful feelings in the face, tic-douloureux, pains in the tongue, jaws, &c.; of disordered stomach, from affection of the nerves, or from imperfect mastication, and of continued constitutional irritation, which may give rise to serious diseases."—("Elements of Surgery," p. 417.)

The diseases of the maxillæ rarely, if ever, have their origin in the cavity or antrum; but, almost without exception where the mucous membrane lining the cavity is affected, this will be found the consequence of disease, or necrosis of some part of the osseous structure surrounding it; these diseases have, therefore, very incorrectly received the general denomination of diseases of the maxillary antrum; a mistake which has led to both erroneous theory and practice, with respect to them.*

Incorrect nomenclature is, without doubt, injurious to science; and it is surprising, how the most enlightened and celebrated pathologists have sometimes been misled by improper names, and, notwithstanding they have been sensible of the inconvenience, have exerted themselves to justify error rather than correct it. Indeed, not a small number of the best curative remedies in surgery, as well as in medicine, may be proved to have been frequently misapplied, or rendered injurious, by the improper technicalities which have been gradually admitted into pathological science.

That the upper and under jaws are equally subject to the diseases in question, is sufficiently evident from the cases related by

* It is chiefly in the performance of their peculiar offices that organs are exposed to the occurrence of those derangements which constitute diseased action. In regard to the bones, this may be observed to hold good, not only in particular bones, but in particular parts of them. According to Baron Dupuytren, of the entire skeleton, the long bones and the jaws are most frequently attacked with osteo-sarcoma and other morbid growths; and out of nineteen cases of tumours of the bones, related by him in his "*Leçons Orales*," thirteen occurred in the maxillæ, five in the long bones, and one in the second phalanx of the index finger. In the cylindrical bones, the parts which exhibit the greatest tendency to disease, are the ends, and in the maxillæ, this is the case with the alveolar ridge; these being in both instances the parts most liable to external impressions.

The principal office of the maxillary bones is to give support and attachment to the alveolar processes and teeth, and hence it is in this character that they are so liable to take on diseased action. It is, then, to the alveolar connexions of the maxillary bones that we have to look, as the peculiar seat of these affections, rather than to the antrum: they are peculiarly diseases of the *jaws* and not of the *sinus maxillare*. This can hardly admit of a doubt, when we consider that, in the words of Baron Boyer, "abscess in the frontal sinus is infinitely more rare than in the antrum;" while the lower jaw, with a mere *canal* instead of an *antrum*, is nearly as often affected as the upper. But it is obvious, that the circumstance of the entire body of the superior maxilla being composed of the thin walls of a cavity, lined throughout with a delicate membrane, has much influence in modifying these affections, as they occur in the upper jaw.

Mr. Fox, in his "Natural History of the Teeth," as well as others which I shall refer to in the sequel of this Essay, and also from general experience; nor do they seem to be less dangerous in the one than in the other; nor to differ materially in their progress of ravage and destruction;* for, while it may be justly supposed that this progress in the upper jaw is facilitated by its greater vascularity and more spongy structure, it must also be considered that this difference of structure, as well as the situation of the upper jaw, affords a greater chance of natural palliation, by the more convenient absorption or discharge of the matter formed by the disease; and while the more dense osseous construction of the under maxilla, and the greater activity of the absorbents in one way retards the progress of the malady; from the lesser curative activity possessed by these parts, and their inconvenient situation for the discharge of the matter, it is less counteracted by the former, and more aggravated by the latter, in the under than in the upper jaw.

In the same way we may account for the fact, that when the upper jaw is affected, the soft parts connected with the disease are more frequently subject to cancerous ulcerations without much tumefaction; while in the under jaw, sarcomatous and osteo-sarcomatous tumours are more liable to occur, and ultimately prove fatal by the supervention of carcinoma.

* It is surprising that this point is not universally conceded. The fashion set by early writers, of treating the diseases of the upper and lower jaw as distinct in their nature and origin, is still generally followed, and even the most recent and exact writers acknowledge the fact of their identity with great hesitation. "Tumours of the upper jaw," says Mr. Fergusson, in his "Practical Surgery," "may, like those last referred to, [of the lower] be connected with the gums, the alveoli, the harder portions of the bone, or *possibly* with the interior of the antrum; indeed, making allowance for the differences in the position, shape, and other physical characters, between this and the lower maxilla, there is *considerable* resemblance between the diseases of each."

It will be seen by analysing the catalogue of cases in the Appendix, that of the 331 whose seat is specified, 56·19 per cent. occurred in the upper, 42·29 per cent. in the under, and 1·51 per cent. in both jaws; and that of the 304 cases whose nature and seat are noted, there occurred:—

Inflammation and suppuration of the upper jaw	12·82,	under jaw	3·98	per cent.
Necrosis	ditto 3·98,	ditto	5·59	ditto.
Fibrous and such like tumours	ditto 20·06,	ditto	15·13	ditto.
Fungous and similar tumours	ditto 14·47,	ditto	14·11	ditto.
Carcinomatous and malignant tumours	ditto 4·93,	ditto	4·93	ditto.

Such tumours ought always to be regarded as consequences of some other primary affections, the tumefaction taking place at any period of the primary disease; and it is probable, that the sooner or later occurrence of the swelling, or the formation of excrescences, depends as much upon the state of the constitution, as on the local affection itself.

In delicate, but otherwise not vitiated constitutions, the bones are much less dense in their structure; and the disease more generally proceeds in a chronic state, than in those that are strong and robust; the matter perforates the bony structure with more facility, and is discharged sooner, and more conveniently; and the disease is thereby constantly relieving itself when arrived at an acute state, and returns to its chronic form; and thus tumefaction is much retarded. It is in this form that the diseases of the jaws are observed most frequently to proceed in the United States; and perhaps also in all other warm climates.*

In strong constitutions, in consequence of the dense structure of the bones, the disease finds more difficulty in forming openings for the discharge of the pus, which is therefore retained and absorbed; the efforts of nature are also greater, the inflammation more active, and the action of the absorbents is more excited; the bones consequently sooner expand, and the surrounding parts enlarge to a considerable size, so as even to produce much deformity at an early stage of the disease: many of the cases which I have seen in England were of this description; and I believe it may be justly presumed, that the malady more frequently proceeds in this manner, than in the former, in this country and on the continent of Europe.

* According to Dr. O'Shaughnessey, of Calcutta, this does not appear to hold good with regard to the progress of these diseases in India. That gentleman, in his "Essay on the Diseases of the Jaws," states, that in the East Indies these diseases are of rapid growth, and generally accompanied with much swelling. If a conclusion can be arrived at from a single case, I should say that these diseases have a similar character in the Levant. In the case of an old Turk, whom I saw at Smyrna in 1841, this disease, in the form of a firm tumour of the lower jaw, had developed itself to an enormous size in little more than fourteen months after its first appearance. This patient had many unsound teeth, and his gums generally were tender and partially absorbed. He was constantly smoking, and appeared very indifferent about his complaint, the origin of which he attributed to a blow on the part.

If judiciously treated, the latter cases admit of more successful treatment than the former; but, on the contrary, if neglected or ill managed, they afford the most dangerous varieties of the disease.

If art lends its aid to remove the local causes of the disease, nature will soon effect a perfect cure without further assistance.*

* A case lately presented itself to me, the early history of which exemplifies so fully the above remark, that I cannot refrain from detailing it. The patient was a young German lady, who, being on a visit to this country, had put herself under the care of one of our fashionable dentists, on account of the deplorable state of her mouth, which contained many stumps that were productive of much local and constitutional irritation. She had had, however, the good sense to refuse to submit to this gentleman's plan of supplying the deficiencies of her mouth, without extracting the offensive and irritating roots and dead teeth. The plan of treatment proposed by Mr. Koecker and myself, namely, in the first place to render the mouth completely healthy, by the removal of all local causes of irritation, and then to insert an artificial piece suited to her case, she at once agreed to. Nine stumps and dead teeth were accordingly extracted under the influence of ether, the idiopathic diseases of the teeth were attended to with the most salutary effect, and, by the insertion of a proper mechanical preparation, we have had the satisfaction of restoring our patient to a state of comfort and renewed health, to which she had long been a stranger.

The following history of this case I beg to give in the lady's own words:—"The subject of the present notice is a Livonian by birth, and seems to have inherited from her parents, in common with her brother and sister, a disposition to bad teeth and morbid gums; from her childhood she has suffered much from tooth-ache. At the age of seventeen, she left her home and went to reside in Moscow, where she still continued frequently to suffer from tooth-ache. On one occasion, in the depth of winter, the thermometer being fifteen degrees Reaumur below the freezing point, excited by the pain, and anxious to consult her sister, who resided at some distance, as to the advisabilty of having the teeth extracted, she left her dwelling on foot, in thin shoes, not at all suited to walking over the snow and ice at such a season. Thereupon the pain increasing, the lady, in whose family the patient was residing deemed it necessary to consult a medical man on the subject, and accordingly sent for the family surgeon, who, on examining the cheek, at first declared it to be of no importance, and prescribed some drops to be put into the tooth on cotton. A few days after this, the cheek began to swell very rapidly, and a bluish spot showed itself under the lower jaw of the left cheek. The surgeon now returning, and considering it as a simple gathering, deemed it necessary to open it, and without warning the patient of his intention, made a deep incision in the cheek, whence, however, flowed no humours, but blood alone. The red ulcerous appearance of the jaw and cheek extending, the advice of several medical gentlemen of considerable experience and reputation was had recourse to, more than one of whom declared the case to be that of a cancer; and finally it was proposed to cut it out. The young lady, however, dreading so terrible an operation, ere she consented, resolved to have recourse to one gentleman more—Dr. P., chief physician and operating surgeon of one of the largest hospitals of Moscow. Dr. P., on examining the face, and after minute inquiry, declared it as his opinion, that there was no case of cancer at that moment, that it was decidedly a case of fistula, but that, if the teeth were not directly extracted, or if the cheek were neglected,

But the constitution being more active in its curative efforts, although incapable of removing the local causes without surgical assistance, the morbid action is liable to be increased by such powerful exertions of nature. If, moreover, these natural efforts are improperly interfered with by the treatment usually applied in cancerous affections, such as the exhibition of henbane, hemlock, mercury, &c., or by operations usually adopted in general surgery, the disease is seldom even palliated, and frequently aggravated by such unnecessary and painful operations, or stimulant remedies, all of which, when applied without a previous removal of the exciting causes, must naturally augment the disease in the same manner as, though in a greater degree than, the unsuccessful efforts of nature. Hence it is in this state, that the disease is more frequently considered incurable, while in fact it is more manageable than in any other; the difference is, that in this the

it doubtless would come to cancer; he therefore advised the patient to have the tooth drawn without delay. The lady immediately waited upon the dentist, a gentleman of the highest reputation in his profession, who, however, either from the agitation of the patient, or probably the inflamed state of the mouth, mistook the tooth, and extracted a sound one instead of that affected. A lotion was now applied to the cheek, but, instead of getting better, the face grew worse, till there appeared no alternative but that of undergoing the dreaded operation, the Doctor at the same time declaring, that he could not be answerable for the result. A few days' delay having been granted to the patient's fears, and that she might see, and, as it were, take leave of her friends, one of the latter strongly urged her to allow him to bring a medical friend of his, in whose experience and abilities he had the greatest confidence, to visit her. This being agreed to, Dr. D. came, and after examining the face, and questioning the patient at considerable length, gave it as his opinion that Dr. P. had been right, that the case was a fistula, and that had the tooth been extracted, the face, with proper treatment, would soon have got well: nor did he think it now too late. In short, it was finally settled, that the lady should put herself under his care at his own dwelling that she might have the advantage of his constant advice and attendance. This being done, Dr. D. proceeded to extract the decayed tooth, which Dr. P. had in the first instance, and he at present supposed to have caused the mischief. The tooth being out, on examining it, the doctor's opinion was confirmed by its bearing all the evidence of the case. He continued to apply the remedies necessary to the inflamed and ulcerated cheek and jaw, being obliged from time to time to cut away or destroy by caustics the foul flesh and excrescences which had formed themselves; extracting, at various periods, as many as eight teeth, till finally, at the expiration of twelve months, or somewhat more, the face was healed, and brought to the state it has since remained in—a period of ten years."

It may be instructive to remark, that the time when this patient was threatened with amputation of the jaw, was exactly that at which the indiscriminate use of the operation was most in vogue.

powerful efforts of nature require more judicious attention on the part of the surgeon-dentist than in the other, in which the more passive state of the parts, and greater chemical activity of the matter, give a more distinct indication of the power of curative means.

In constitutions, however, which are not only suffering from debility, but which are at the same time under the influence of actual disease, or of a general vitiated state of the system; such as is induced or excited by scrofula, scorbutus, syphilis, the abuse of mercury, or powerful narcotic medicines, &c., the diseases of the jaws most frequently proceed rapidly to their greatest extent and fatal termination. They are, moreover, produced often by the slightest causes; sometimes one dead tooth or stump is sufficient to give rise to great inflammation and mortification in the bony structure of the jaw, as well as in the membrane lining the cavity, and to hasten the primary disease through all its different grades; while exposure to great cold or heat, an accidental blow, or fall, or any other irritation of a similar kind, acting upon the structures contiguous to parts already symptomatically affected, is quite adequate to excite, at every period of the malady, any of the secondary diseases, such as polypi, or œdematous, sarcomatous, and osteo-sarcomatous tumours and excrescences. Indeed, these secondary tumours may sometimes be observed at a period, when the primary affection is so little advanced as entirely to escape surgical observation; and they may proceed to their greatest extent in a period of one or two years, before the idiopathic disease of the bony maxillary structure has had time to proceed to an advanced stage.

In this form, the malady will be most frequently observed among the poorer classes of society, and it is unquestionably the most unfavourable and least manageable kind of maxillary disease; it requires a combined and judicious medical, surgical, and dental management to obtain a desirable result; for in few instances will any separate treatment prove of any permanent benefit.

Thus every active general treatment, for instance, without the removal of the local causes of both the primary and secondary local malady, will only aggravate the disease, and hurry it to its malignant state. And thus the surgeon, after the removal of a

polypus, spongy, or bony tumour, will often be disappointed by its rapid return, unless the morbid structure of the jaws be also removed or cured; nor will it, in the above instance, be sufficient to attend to the primary disease of the jaw itself, the extirpation of the excrescence or tumour will generally be indispensable.

But, on the other hand, if, in such instances, the affected jaw or a part of it be removed, without a proper attention to the constitution and the morbid local predisposition of the other parts of the mouth, a return of the disease in the remaining portion of the maxilla, is just as probable as under either of the former suppositions, notwithstanding the amputation may appear at first successful.* Independently of this, it must be admitted that it is in

* There is a case recorded in No. V. of the "Glasgow Medical Journal," and republished in the "Medico-Chirurgical Review," which strikingly exhibits the truth of this statement. "A female, aged 37, was admitted into the Glasgow Royal Infirmary in 1823, for a fungus of the antrum of the left side, which began two years before, *after long-continued toothache.* Dr. Anderson destroyed the fungus by exposing the anterior wall of the antrum, removing the whole of it, scooping out the fungus, and applying the actual cautery to the diseased surface. The cicatrization of the wound, after being a little delayed by the occurrence of erysipelas, was ultimately perfect. For more than five years, Dr. Anderson continued to visit this woman, during which time she suffered much from rheumatism, and happened to break the neck of the left femur, but had no return of the fungus in the antrum. In April last she complained of *toothache in the lower jaw* and a last molar tooth was extracted, soon after which a fungus appeared in that situation. On the 5th of September, Dr. A. saw the tumour, but did not feel warranted in operating, on account of the state of the patient's health, and the suspicion that the fracture of the femur had arisen from a malignant diathesis. On the 23rd of October, at the patient's request that something should be done, on account of the repeated hœmorrhages, Dr. A. advised a consultation with his colleagues of the Infirmary. At this time a firm spongy tumour occupied the left side of the inferior maxillary bone, from the symphisis backwards to the angle. It felt soft and elastic; its upper surface was flat, sloughy, and indented by the teeth of the upper jaw; it pervaded the whole thickness of the bone; *the grinders on this side were carious, and the whole of the incisor teeth loose; a thin fœtid fluid constantly oozed from the mouth,* and hœmorrhage had repeatedly occurred to such an extent as to induce syncope. The tumour was occasionally affected with gnawing pain, which extended to the head; the countenance was sallow, the pulse 110, small, the appetite bad, and the health much reduced." Amputation of the lower jaw was performed, and union took place; but on the thirteenth day the patient sank and died of chest affection.

The disease in this case, to say the least of it, was *attended* by caries of the teeth during its entire progress, which could not fail to give rise to a considerable degree of irritation. Had the mouth been kept healthy after the first operation, instead of being allowed to go on from bad to worse, I have no hesitation in saying that the patient would have had a much better chance of escaping a relapse and its fatal consequences, to say nothing of the effect of attention to the health of the mouth, from the first, as a curative measure.

itself fraught with more immediate danger than the other modes of treatment; and, although it may now and then succeed, it is scarcely practicable in very late stages of the disease. Indeed I am inclined to assert, that there is no chance of its success at any later period than when a simple removal of the exciting causes, with the consequent tumour, and a due attention to the constitution, would fail to ensure a complete, and certainly a more desirable cure.*

OF THE CAUSES OF THE DISEASES OF THE JAWS.

The proximate causes of these diseases are, as far as my experience has enabled me to judge, inflammation, suppuration, and mortification, commencing in the alveoli and the periosteum, and thence extending to the osseous structure, and the lining membrane of the cavity of the jaw.†

* Although there are many cases in which excision, more or less extensive, of the jaw-bones, has been resorted to, when the curative means at the command of dental surgery ought instead to have been put in practice, still there are continually occurring cases, which having, from neglect or mismanagement, been allowed to run their course through all the early stages in which they might have been cured, are no longer within the reach of dental treatment; the greater part, or the whole of the bony structure of the jaws being disorganised, and the parts converted into a mass of disease, bearing hardly a trace of tooth, gum, or socket. Cases such as these, having been permitted to proceed beyond the province of the dentist, and the organs that he would have to operate upon being no longer in existence, must be considered as utterly incurable, and consequently as requiring the operation of amputation—the only remaining resource of art. And an admirable application of the art of surgery it is, which frees the wretched sufferer from a load of disease equally disgusting to himself and those around him, when all other means have ceased to promise hope. But, unfortunately, the most distressing cases of disease of the jaws are beyond the power of even operative surgery; the malignant character assumed by such, and the consequent certainty of their being reproduced, deter the surgeon from attempting an interference, which would inevitably prove but a prolonging of suffering, if not immediately fatal. The result of numerous cases of excision of the jaws proves that tumours of the most enormous size, if not of a malignant nature, may be successfully removed by amputation. At the same time, the history of a vast number of even the most malignant cases shows, that in their early stages they might have been effectually controlled by dental treatment, and at no period of their course is there any other plan that offers a chance of cure.

† Some increased action or irritation either in the investing or lining membrane of the maxillæ, undoubtedly constitutes the first link in the chain of morbid causes. The vascular membrane lining the alveolar depressions, is by much the most fre-

The local exciting causes are, not only those already stated as the proximate causes of the disease, but also all diseases of the

frequent seat of the original irritation, forming as it does the principal connecting medium between the teeth and jaw-bones, and uniting in the most intimate manner, in the cells and Haversian canals of the cancellated substance, by innumerable processes, with the prolongations of the lining membrane or *endosteum* of Dr. Walshe. With this irritation of the alveolar periosteum, may be associated fleshy cysts attached to the extremities of the fangs of the teeth, or an enlargement of these parts similar to the ivory exostosis of other bones. The morbid action in the periosteum, in the first instance, does not usually proceed beyond a certain low chronic form of inflammation, but it has all the essential characters of periostitis, and is always liable to pass into the acute state, and to end in abscess, fistula, or necrosis. But this, comparatively, seldom takes place; on the contrary, the injection of the membrane gradually yields to thickening, its tissue alters to a cartilaginous texture, the structure of the bone is soon involved, and the effusion of cartilage extends within its substance. As the bone becomes engaged, it loses its density and gets infiltrated with an albuminous substance, more or less dark in colour, and not unfrequently accompanied by the formation of pus. Ossific matter may also be deposited in these adventitious tissues, and in some cases the morbid action is confined entirely to a deposition of bone. Thus we have in the progress of simple irritation of the membranous investments of the maxilla, materials, as it were, furnished for the formation of every variety of tumour to which the maxillary bones are subject.

The different forms in which the diseases of the jaws occurred in the 335 cases contained in the Appendix, were—

Inflammation	4
Inflammation and suppuration	50
Necrosis	29
Fibrous tumour	24
Fibro-cartilaginous tumour	37
Sarcomatous tumour	43
Osteo-sarcomatous tumour	57
Steatomatous tumour	2
Medullary sarcoma and fungus hæmatades	10
Carcinomatous tumour	20
Fungous tumour	32
Bony exostosis	5
Undescribed	22

The morbid anatomy of these diseases ought to throw much light on their nature and origin, but little has hitherto been accomplished in this respect. It has been remarked, however, that the roots of such teeth as are involved in the diseases of the maxillæ, when examined, are found highly injected with blood—corresponding signs of morbid action being observable in the substance of the tumour. The case of William Thompson—the first in Mr. Liston's paper on the Tumours of the Mouth—furnishes an instance of this. "At the upper part towards the alveolar processes," says that gentleman, "it is broken up and bloody-looking, more *especially at that part attached to the roots of the decayed molar tooth.*" "I should be inclined to think," he proceeds, "both from the history of the case, and from the morbid appearances, that the disease had commenced at this point, and extended to the lining membrane of the cavity, which it now fully occupies." —(Transactions of the Medical and Chirurgical Society, v. xx.)

Mr. Berard, in the *Dictionnaire de Médecine*, article Machoire, cites some re-

teeth, alveoli, periosteum, and gums; as also dead and loose teeth, and decayed roots, or stumps of teeth, and tartar; all of which will generally, more or less, be observed to accompany the diseases of the maxillæ. See my "Principles of Dental Surgery," Cases 4, 24, 25, 26, 27, and 33 [being Nos. 60, 61, 62, 63, 64, and 65 of the Catalogue in the Appendix.]

These local causes are much aggravated by the slightest derangements of the constitution, such as general maladies of an acute and chronic nature, and, more particularly, a disordered state of the fluids and solids.

An unnatural and improper diet, whether deficient in nourishment or debilitating by its stimulating effects, such as the abuse of wine, and ardent spirits; all powerful medicines and narcotics, even those remedies generally considered specifics against cancerous disease; such as henbane, hemlock, and mercury; indeed, any general stimulating medicine which is administered, previously to the removal of the local irritating causes, will tend materially to aggravate the maladies. The improper use of mercury, in some instances, however, has been the original cause of these diseases; of this, case No. 3 of this Essay furnishes a striking illustration.

The local predisposing or remote causes of these affections are a peculiar formation of the maxillæ and teeth, such as a soft structure of the former, or unusual length, and curved formation; and, especially, an irregular and inconvenient situation of the fangs of the

searches of M. Ribes, which are strongly corroborative of these statements, although he himself does not allow them to have any weight in the formation of his opinion of the pathology of the diseases of the jaws, which he states to be, that "the causes under the influence of which these tumours make their appearance are in general very obscure." Referring, however, to these researches, he says:—"M. Ribes found on the body of a man, aged sixty, a hard tumour of the size of a walnut, situated on the right side of the lower jaw, near the first molar tooth. This tumour was dissected and separated from the gum, and was observed to occupy one of the alveolar depressions, which was greatly expanded. The substance of the bone surrounding it was cut away in slices and the tumour laid bare. He noticed that it adhered firmly to the walls of the cavity, especially near the top, and that at this part it was *continuous with the dental blood vessels*, the size of which was much augmented, the canal containing them being increased to double its ordinary volume. The tumour was pretty firm; when cut into, it presented a fibrous lardaceous appearance. There was neither caries nor necrosis of the bone to be detected. In another case, MM. Ribes and Bayle dissected together a tumour similar to the preceding, but considerably larger; and were able, as they say, to discover very plainly the *connexion of the tumour with the dental vessels*."

latter, by which an unnatural and morbific mechanical irritation is produced, by the pressing of one jaw upon the other, particularly during mastication ; this irregularity I have frequently observed in cases I have had an opportunity of examining.

To these may be added a great variety of mechanical, accidental, and artificial causes, such as external injury, exposure to cold, and all improper and improperly performed dental operations. Among the latter may be enumerated the extracting or breaking out of teeth with undue violence; the injudicious insertion of artificial teeth; the transplanting of teeth from one mouth to another (the danger accompanying this operation is best illustrated by referring the reader to a most distressing case, which proved fatal, related in the " Medical Transactions of the College of Physicians of London," vol. III., page 325—338*); the replacing of teeth, which have been extracted either by mistake, or with a view to render them incapable of being painful;† the

* As the " Medical Transactions " are comparatively little known, I shall transcribe this interesting and melancholy case. " An unmarried lady, twenty-one years of age, had one of the incisor teeth in her upper jaw affected with caries; it was extracted, and its place very dexterously supplied by a like tooth from another young woman, who, upon a most rigid examination for the purpose, appeared to be in excellent health. The implanted tooth very rapidly took a firm hold, and soon bade fair to be of great service and ornament. In about a month, however, the mouth became painful, the gums inflamed, discoloured, and ulcerated. The ulceration spread very fast; the gums of the upper jaw were destroyed and the sockets left bare. Before the end of another month the ulceration stretched outwardly over the upper lip and nose, and inwardly to the cheeks and throat, which were corroded by large, deep, and fœtid sores. The gums soon became carious, several of the teeth successively dropped out, and these at length were followed by the implanted tooth, which had hitherto remained firm in its place. About this time also blotches appeared in the face, neck, and various parts of the body, many of which became painful and extensive ulcers: a considerable degree of fever, apparently hectic, was excited; a copious and fœtid discharge flowed from the mouth and throat and impeded sleep, and the soreness of the parts which performed deglutition prevented a sufficient nourishment from being swallowed. Medicines exhibited in every possible form that science matured by experience could suggest, failed altogether of removing or even mitigating the unhappy sufferer's distresses: the virulent taint or putrescent tendency established in the system, though occasionally driven back, as often rallied and ultimately prevailed: the patient fell a victim to it, in the greatest anguish and misery. The person from whom the tooth had been taken had all along continued to enjoy the most perfect health ; she was frequently and scrutinously examined, without a single trace of disease being discovered existing in her person or constitution."

† The retaining in the mouth or the replacing of teeth that have been luxated

luxation of teeth, or the partial extraction of them by tearing, or dividing the nerve cord or fasciculus of the nerves, with a view to render them free from pain, and subsequently leaving them in their sockets; all operations performed with an intention of destroying the nerve or sensibility of painful teeth, and thus to cure the tooth-ache—all of which not only effect a sudden destruction of the vitality of the teeth, but are productive of violent and permanent irritation upon the parts locally as well as generally connected with them—such as the application of concentrated acids,

by accidental violence, as generally practised, must, of course, be ranked in the same category. I cannot concur with Mr. Bell in his remarks on such accidents, and the treatment which he recommends for adoption. After detailing the effects of retaining teeth that have been partially luxated, and giving instructions regarding the method of securing them in their sockets, he proceeds:—"In cases of total dislocation, where the tooth has been forcibly struck out of the socket, there is generally so much injury inflicted upon the alveolar processes that still less hope exists of its being replaced with any advantage. There is one favourable circumstance, however, which belongs to such a case, and that is, the opportunity which it affords of clearing the socket from any coagula which may have formed there. For this purpose, warm water should be thrown into it by means of a syringe, and after all the blood is thus removed, which may be assisted, if necessary, by a pair of small dressing forceps, it should be further cleansed by a small bit of lint rolled round the end of a probe. The tooth having been placed for a moment in warm water, about the temperature of the body, is to be restored to its exact situation, and supported, as before directed, by a ligature, embracing one or two teeth on each side of it." ("Anat. Phys. and Dis. of the Teeth," p. 184.) Such treatment being based on the notion that the teeth, after their vital connexion with the system is destroyed, can again resume their functions as living members of the body, I cannot but condemn as opposed to all sound views of dental pathology. Dr. M'Lellan's case (No. 198 of the Appendix) clearly originated from such treatment in partial luxation.

But the most notable example of this mistaken practice on record is that contained in the following account of an operation performed on his own person by M. Delabarre, who is one of the most eminent of the Parisian dentists, and certainly the most celebrated writer on dental surgery among the French. "I have performed," says he, "upon myself, and also upon several other persons, an analogous operation, which consists in extracting a diseased tooth, removing its soft central parts, filling it with gold, *shortening its extremity*, and then replacing it. After five years, this tooth is now as solid as the rest. Still I do not doubt that it will one day end in being separated from the jaw, for it frequently occasions me very acute local pain, and aggravates the tic douloureux, to which I am subject. This neuralgia always commences at the tooth, and then spreads itself over the whole side of the head; so that I frequently repent of having replaced it." ("Delabarre's Second Dentition," American translation, p. 51.) The *naïveté* of the above statement is really ludicrous. It is evident that M. Delabarre is a very sincere man, but he is not on that account the less dangerous as a practitioner.

and caustics, the actual cautery, or the knife for the extirpation of the lining membrane of the teeth;* and lastly, and above all, the

* Until recently, the means used for destroying the sensibility of the teeth were nitric acid and the actual cautery; but the dentists of the present day have become more fastidious in regard to the substances they employ for this purpose. Thus, chloride of zinc, pure tannin, nitrate of silver, and arsenic, have each their admirers, and one ingenious Frenchman (see "Lancet," 1834—35, i. p. 931) has invented a modification of the hydrogen jet on spongy platinum to supersede all other cauteries, actual or potential. But the most effectual plan for accomplishing the destruction of the vitality of the teeth is a combination of chemical and mechanical means, recommended by Mr. Saunders, in his lectures at St. Thomas's Hospital. "In order to do this," says the lecturer, "the dentist will, with a sharp cutting instrument, remove a layer of the carious bone, and, at the same time, by a sharp and dexterous movement, excise the exposed surface of the pulp. We have now a bleeding, instead of an inflamed and highly tense surface; and if we now apply a few granules of the white oxide of arsenic, an eschar is formed in the course of a few hours, which will be totally insensible, and capable of sustaining pressure. . . . I prefer to apply the arsenic on a plegget of wool or lint, previously dipped in creosote. This then constitutes the radical treatment for the actual forms of toothache, and is preliminary to the restoration of the organ to its wonted function, by the very beautiful and valuable operation, *now so well understood* and so generally employed" [namely, 'stopping.'] ("Forceps," March, 1845, p. 50.)

To medical men it is unnecessary to point out that an eschar formed on the pulp of a tooth obeys the same laws as an eschar of any other tissue, and that, consequently, however minute the process may be in such parts, separation by ulcerative inflammation must naturally follow the formation of a slough here as elsewhere, and I leave it to them to judge, whether such a state of parts constitutes a proper preparation for the insertion of a material to take the place of the lost substance of a carious tooth. To me it appears hardly less objectionable than would be the production of gangrene in the stump of an amputated leg, as a preparation for the adjusting of an artificial limb. But the truth is, that the eschar resulting from this application of arsenic is tantamount to *destruction of the entire pulp*, which, so far from being a texture capable of throwing off an eschar of its substance, and then healing, is a delicate tissue of vessels and nerves, that incurs the most imminent danger of being destroyed by even a slight and superficial wound. The artificial destruction of the pulp, moreover, is never effected, without involving in necrosis some portion of the walls of the pulp-cavity of the tooth.

I regret to observe, that Mr. Tomes also is an advocate of this *destructive* treatment; which is, nevertheless, utterly at variance with that physiology of which he is so eminent and successful a cultivator. "It is a very good practical rule," he says, "if in removing the softened dentine, or in pressing a probe in the cavity, pain is felt, but only so long as the instrument remains in contact with the tooth, to proceed to plug the cavity; but if the pain continues after withdrawing the instrument, to postpone plugging, and resort to some means to restore the pulp to a healthy condition, or to *produce its destruction*," ("Medical Gazette," 1847, vol. xxxix. p. 357.) "Escharotics," he continues, at p. 756, "may be used in a diluted form, so as to destroy the surface only, or they may be applied in a more concentrated state to *kill the whole body of the pulp*."

The sole object of stopping carious cavities being to preserve *alive* the teeth that are affected with them, and the operation, so far as it is curative (and not simply preventive, and of the nature of a restoration of lost parts, like the after

operation of cutting off the crown of a tooth; a treatment which has lately been recommended for the tooth-ache. See "Principles of Dental Surgery," Cases 33, 4, 35, 42, and 27 [being Nos. 65, 60, 59, 66, and 64 of the Catalogue in the Appendix].

With the exception of this last operation, the various methods, which have been recommended by Hunter, Fox, and other dentists, for the purpose of destroying the vitality of the nerves of the teeth, have been adopted to cure or preserve the teeth themselves, more or less with a view to their subsequent utility, and although the good effects may be very doubtful, their authors are entitled to our consideration and gratitude for their humane intentions. But the operation of breaking or cutting off the crown of painful teeth, which the inventor calls excision, is nothing less than an amputation by violent means, and cannot be adopted from any other cause than a culpable timidity on the part of the patient or the dentist, who are thus led to substitute it for the necessary extraction of the teeth, without even preserving the only useful and essential part, viz., its crown.* It unquestionably

filling of the cavity), being really an extirpation, and having for its great aim the perfect and total removal of every portion of dead or diseased tissue, it is obvious that the practice which prepares the tooth for the reception of the stopping, by producing either partial or complete destruction of any of the parts that are the subjects of the operation, must be based on a total misconception of the principles of the treatment.

* This operation is now much less practised for the cure of tooth-ache than formerly: yet I have known it performed quite recently by dentists who enjoy the confidence of the public. But as preparatory to the operation called "pivoting," which consists of engrafting a new crown upon the roots of decayed teeth, it is part of the every-day practice of all classes of dentists.

Pivoting is a mode of fixing artificial teeth, which enjoys a high reputation both among professional men and the public; it is, however, an operation involving so much that is at variance with sound pathology, that I have no hesitation in saying it may with reason, as usually performed, be ranked among the occasional exciting causes of the very serious diseases which form the subject of this essay. This has long been the opinion entertained by the author, who, in his "Essay on Artificial Teeth," thus expresses himself:—"This method of inserting artificial teeth, is one which requires great caution, and is frequently highly objectionable, from its being always attended with more or less irritation, which is sometimes of a dangerous, and even fatal nature; I will not, however, deny that it has frequently met with considerable success, and has not been followed by much inconvenience, but that such artificial teeth have, as Fox states, been used for many years without requiring repair." . . . . "By the preparation of the fang, and by the attachment of the artificial tooth, every morbid irritation of the dead fang upon the living surrounding parts is excited and rendered generally more permanent than when left alone to the influ-

effects, although neither without pain, nor so instantaneously as is asserted, a destruction of the vitality of the remaining roots or stumps, which then become extraneous bodies; the permanent irritation of which, however, must tend to excite disease and induce mortification not only in the adjoining parts, but also in the remaining teeth and gums—not to mention the very great and dangerous irritation produced at the same time upon the whole nervous system.*

ence of nature. Moreover, by the insertion of the pivot into the canal of the root, the natural curative process, in the decomposition and absorption of the fang, is either prevented or retarded; while, on the other hand, the most convenient outlet for a constant and regular discharge of the matter, which is always produced by the carious root in the surrounding soft parts, is obstructed, and extensive and painful swellings of the face and jaws are the consequence, sometimes accompanied by great disturbance of the constitution. . . . . "It would, therefore, be best to abandon the operation entirely in dental surgery, if it were possible; but such are its mechanical advantages, and its immediate, apparently, good effects, that it would be most difficult in many instances to dissuade the profession or the public from the adoption of an operation which has been so long sanctioned by custom, and even lauded for its immediate success, while its ultimate dangerous and injurious effects have remained unobserved, and have been almost invariably ascribed to erroneous causes. I shall, therefore, content myself with attempting the amelioration of a treatment the total avoidance of which seems not to be obtainable."

Some surgeons have taken the same view of this operation as that expressed in the above quotation, but the dentists almost universally regard the pivoting of the teeth as one of the most ingenious and successful efforts of their art. Mr. Liston, in his lectures, observes,—"Inflammation [of the jaws] also frequently follows the bad operations of the dentist, such as pivoting the incisor teeth. In this proceeding the crown of the tooth is removed, and a false crown is fixed into the remaining part by means of a pivot, which is pushed into the cavity formerly occupied by the pulp of the tooth. Now, this is sometimes followed by active inflammation of the remaining portion of the pulp extending to the socket, which runs to such an extent as to terminate only in the exfoliation of the alveolar process, and the loss perhaps of several other teeth in consequence."—"Lancet," 1843—4, vol. i., p. 170.

Dr. Smethurst, in the "Lancet" for 1844, vol. i., p. 412, has recorded a very instructive case, fully exemplifying the occasional effects of pivoting, in their acute form, to which I beg to refer the reader, only premising that the patient was hardly more fortunate in the choice of his second dentist; for the artificial tooth, *fastened with gold wires to the adjoining teeth*, which he inserted in place of the pivoted one, was as objectionable an appliance as could have been contrived.

* "The teeth having been deprived of their vitality, by the destruction of their pulp, are not only rendered useless, but are converted into lifeless encumbrances upon the system, which produce, by their mechanical and chemical irritation, an action similar to that caused by gangrene or mortification in other bones, by which nature attempts to throw off the dead parts.

"The parts surrounding such dead teeth, namely, the gums, periosteum, sockets, and maxillary bones, are thus involved in serious disease; inflammation gradually

For proof of this assertion I have only to refer the medical reader to a careful examination of the parts, which will evince the fact; for it will be found that, in a hundred jaws containing roots or stumps, without one single exception, the parts contiguous to the roots exhibit some marks of disease or mortification; unless, indeed, the teeth have been broken after the death of the subjects from which the teeth are taken.

In all preparations of the maxillæ, which contain stumps or roots, the gums will always be found more or less inflamed, and the sockets either wasted away by gradual absorption, or in a state of mortification, and often spongy, perforated, &c.* Where the expulsion of the roots of teeth has been left to the slow process of nature, a total destruction of the alveoli is the inevitable consequence; and not unfrequently, very considerable portions of the bony structure of the jaw will perish through the diseased action. When, however, a tooth or teeth have been timely extracted, not more than the extreme process of the alveoli is generally absorbed.

extends over the whole of these parts; and a strong effort appears to be made to effect the expulsion of the decayed teeth, now become dead and offending bodies." —" Principles of Dental Surgery," page 94.

This was written in 1826, when, I may say, the author stood alone in advocating these opinions. Since then, many of the American dentists have given in their adherence to his principles, and one or two of the writers on Dental Surgery, in this country, have signified their *belief* in them *in theory*, but I do not know a single English or Continental author who shows his *conviction* of their truth by acting up to them *in practice*. Indeed, I am inclined to think that, with few exceptions, the dentists in this country would be ready still to dispute even the theoretical truth of these principles. For their benefit, I add the following quotation from the clinical lectures of Sir Benjamin Brodie:—" The cause in which the disease [suppuration in the antrum] originates is generally a diseased tooth, which by and bye gives rise to tooth-ache. The inflammation on which the tooth-ache depends then terminates, *as it always does, in the death of the pulp of the tooth.* Then the whole tooth dies, and is now like a portion of dead bone, or any foreign substance, stuck in the jaw."—" Medical Gazette," vol. xv., page 347.

* M. Chassaignac's observations, in regard to an analogous state of parts, confirm this statement. At a meeting of the *Académie des Sciences* he remarked that, " in preparing the lymphatics of the head and neck in young subjects, he had often met with an anatomical change of structure of interest in regard to the effects of irregularities of the teeth. The tooth examined in the alveolus presents no alteration: but the maxilla, being completely denuded, is found perforated with several small holes, in the neighbourhood of the root of the tooth. If this diseased lamina of bone be removed, the fang of the tooth is generally found diseased and surrounded with pus. This intra-alveolar caries must often escape observation during life, and is, doubtless, in many instances the cause of the enlargement of the maxillary glands, and of certain purulent collections in the same region."—" American Journal of Dental Science," 1846, p. 326.

while the greater part has been transformed by healthy granulation into a strong bony ridge, frequently maintaining a height nearly on a level with the sockets of the remaining anterior and posterior teeth of the same side.*

But, as regards every beneficial effect which has been asserted to result after the excision of the crown of teeth from the remaining stumps or roots, and particularly as to their possessing a power of granulation, it is hardly necessary to observe, that such assertions are entirely unfounded and erroneous, and in total opposition to all sound physiology and pathology, as well as to observation and experience.

Indeed, were such injudicious and unnatural treatment in dental surgery to be extensively adopted, we might certainly look forward not only to a considerable augmentation of all kinds of diseases of the teeth, and their gums and sockets, but also of this terrible malady of the maxillæ. Fortunately, however, this treatment is so evidently absurd, and its inconsistency with all good surgical principles so glaringly visible, to all who are in any degree acquainted with the most common and simple physiological and pathological facts concerning the parts involved in such an operation, as to render it quite undeserving of further refutation, had not even the principles of the operation been already perfectly refuted by all the most important facts and arguments maintained throughout my "Principles of Dental Surgery," but more especially in part ii., chap. 2. "On the morbid effects of dead teeth, and stumps, and roots of teeth," to which I must refer the reader for a more extensive inquiry into the subject.†

* For the perfect completion of this process, and the formation of sound gum, a period of one month additional must be allowed for every ten years of the patient's life after the age of twenty-one.

† The following passage from the work referred to in the text, contains a summary of the author's views on this subject: "The unfortunate manner in which most of the authorities and writers on dental surgery have confounded causes with effects, and effects with causes, or in other words the morbid effects produced by complicated caries with those occasioned by dead teeth; and the apparent similarity between the symptoms accompanying simple caries and those of dead teeth, seem to have induced them to attribute all those primary diseases of the mouth and those painful symptoms which dead teeth produce upon the general system, to the living diseased teeth only.

"In consequence of this surprising misconception of the real causes, such

remedies as most speedily destroy the life of the tooth have been in general recommended with the view of preventing the symptoms and morbid effects which accompany the process of gradual destruction, but which in reality hasten and augment, and even actually create the most powerful causes of the malady for the sake of which they are adopted: and hence such surgical treatment and operations have been introduced, as, while they are intended to cure such teeth as are irreparably lost, injure and even destroy the health and life, as well of the sound teeth as of those more or less diseased. The most lamentable effects of such practices are their general adoption, on the authority of those writers, whereby not only discredit is brought upon this useful art, but also the greatest injury inflicted upon human health and happiness.

"If general surgery were practised upon similar principles, what would be said of that great art, which now holds so eminent a rank from its real importance and utility in the estimation of every liberal-minded man! Would it not sink beneath the lowest occupation, and would not its professors justly deserve reprobation as destroyers of mankind?"

† It will be seen at a glance, by means of the Analytical Table of Causes accompanying the Catalogue in the Appendix, (to which I beg to refer the reader), that the whole number of cases there brought together, may be divided into two great classes; namely, first, those in which the causes are specified; and, second, those in which no causes are assigned:—the former amounting to 172 cases, the latter to 163.

Dividing the first class of cases into groups, according to the arrangement of the text, we shall find the causes to stand thus—

1. Idiopathic diseases of the teeth and sockets	111
2. Constitutional affections	7
3. Peculiarities of construction of the jaws and teeth	9
4. Accidental, mechanical, and artificial causes	54

1. In regard to the first of these sub-divisions it may be remarked, that considering the frequent occurrence and injurious consequences on the alveoli, of the disease known by the name of "absorption of the gums and sockets," we might expect to find it represented by a higher number. This being a disease almost always overlooked by the medical practitioner, there can be no doubt that many of the cases for which no cause is assigned might, by careful inspection, have been included in this division. 2. It is evident, from the small numbers of the cases referred to constitutional vitiation, that those causes receive little attention; five of the seven cases recorded being dependent on the local effects on the mouth of the syphilitic and mercurial poisons. 3. As a predisposing cause associated with various primary affections of the teeth, anomarality of structure and arrangement of the alveoli and teeth, is, without doubt, very frequently overlooked. 4. The mechanical and artificial causes may be thrown into two groups, namely, twenty-six cases necessarily connected with idiopathic diseases of the teeth, consisting as they do of operations directed to the cure of dental caries, which indeed might with propriety be included in the first division, thus raising the number of the idiopathic diseases of the teeth and sockets to 139 cases; and twenty-eight cases of purely accidental causes not necessarily associated with any previous disease of the mouth. Of these latter twenty-eight cases, however, seven were accidents occurring to persons whose mouths were not in a healthy state.

The second class, composed of cases having no cause assigned, speaks for itself. It consists of seventy cases totally unrecorded in respect to the early history and original source of the disease: eighty-one cases, whose history contains

no account of the state of the mouth, but affords indications of their origin being connected with the alveoli and teeth—in seventeen of these cases the indications to that effect being quite conclusive; and twelve cases in which the teeth themselves are reported sound, but no proper account given of the condition of the whole mouth, seven of them, moreover, showing evidence of the gums and alveolar processes being particularly implicated.

It is a remark made by Sir Charles Bell, ("Cases of Surgery," vol. i., p. 4, and "Lancet," 1833-4, vol. ii., p. 216) that "the teeth, gums and alveolar processes have something in common;" that "they are one in constitution, and consequently one in disease;" and that "there thus exists a part of the jaw-bone intimately connected with the constitution of the teeth." Mr. Fox, to the same purpose, remarks,—"The alveolar processes are to be considered as necessarily belonging to the teeth, and not essential to the formation of the jaw-bones." ("Natural History and Diseases of the Human Teeth," part ii., p. 93.) Considering, then, this intimate connexion of the alveolar processes with the teeth, and comparative disconnexion with the body of the maxilla, the many evidences that have been adduced of the alveolar portion of the bone being the usual seat of the diseases of the jaws in their early stages, the notorious liability of the teeth—so continually exposed to a variety of vital, chemical, and mechanical influences—to the ravages of several painful and tedious diseases, and the very frequent occurrence of dental caries and other affections of the teeth, as forerunners to the diseases in question, we may regard it as demonstrated, that the disorders of the teeth are, almost without exception, the original sources of the affections of the maxillæ. This is rendered, if possible, still more certain, by the circumstance that those cases which at first sight seem to be exceptions, probably appear such, on account of the want of attention generally displayed by medical men to the exciting and other causes of these diseases. In relating cases which have been the subjects of operation, they are too ready to leave the history and early symptoms of the disease to give a detailed account of the steps of the operation. Many, even while mentioning the presence of carious teeth, swollen gums, &c., seem quite unconscious that such affections of the mouth are capable of giving rise to more serious diseases of the neighbouring parts. A most extraordinary example of this blindness to the agency of morbid conditions of the teeth in the production of the diseases of the maxillæ is to be found in Dupuytren's remarks on one of the cases of osteo-sarcoma given in his "*Leçons Orales.*" After tracing, in his relation of the case, decayed teeth to be the original symptom, and the alveolar ridge the earliest seat of the disease, and finding in the tumour, after its removal, several carious teeth pushed out of their sockets and embedded in the tumour, he proceeds.—"In the above case this malignant disease developed itself *without apparent cause*, in a healthy person in the full vigour of life." ("Injuries and Diseases of the Bones, translated by Le Gros Clark," page 422.) Thus also, we frequently find the teeth reported *quite sound*, for the purpose of showing that there existed no dental irritation, at the very time that all the symptoms of alveolar absorption are enumerated. This is very obviously so in Mr. Hetling's case,—no. 310 of the Catalogue.

When we reflect that in the adult jaw-bones there are no fewer than thirty-two distinct articulations, which, on account of the firmness of their connexion, the unyielding character of the teeth on the one hand and spongy concellated nature of the alveoli on the other, as well as the presence in each of distinct vessels and nerves—terminating in the delicate pulp, which in structure and sensibility has been compared to the ganglia of the nerves—are the most peculiar of the whole body, we shall be able to perceive the reason that the maxillæ are so liable to be seriously deranged by direct violence. Blows on these bones

ON INFLAMMATION AND SUPPURATION OF THE JAWS.

Inflammation of the maxillæ, the most common disease to which they are liable, much resembles inflammation of the sockets of the teeth, being either an extension of it, or originating from the same causes which produce the latter affection.

At the commencement of the disease, and frequently for some time after, the morbid irritation arising from the above causes, either in consequence of the immediate contiguity or the sympathy

may doubtless induce disease directly as in other bones, but in the great majority of such cases, the immediate effects soon pass, the remote effects which follow being the consequence of injury primarily sustained by the teeth or their sockets. Moreover, some of the teeth may be in a state of disease at the time of the accident, and the chances are very great that this is the case. Indeed, it will very often be found, where disease of the jaws comes on after the receipt of an injury or exposure to cold, that there previously existed some affection of the teeth or sockets. Mr. Liston's remarks, in regard to the influence of diseased teeth under the action of atmospheric impressions, apply with equal force to cases of external violence. "A person," says he, "has laboured some time under caries of the teeth, the crowns have wasted away, and the jaws contain some considerable number of stumps. The patient is, perhaps, out of health, or has been exposed to severe weather, and his face begins to swell, the sockets of his teeth become inflamed, and perhaps an abscess forms at the root of one of them, or sometimes a sort of fungus grows about it. In this way inflammation may be propagated into the antrum, an abscess may be formed in it, and then you have the foundation laid for a great deal of mischief."—On the Tumours of the Mouth. "Transactions of the Medical and Surgical Society," vol. xx.

The conclusion to be drawn from the above facts and considerations, namely, that the diseases of the jaw-bones are almost invariably caused by primary affections of the teeth and sockets, is supported by the authority of some of the most eminent surgeons of the present day. "Where matter forms in the cavity of the antrum," says Sir Benjamin Brodie, "I certainly believe that, in most instances, there is some local mischief first, and that suppuration of the membrane lining the antrum supervenes as the consequence." ("Medical Gazette," vol. xv., p. 437.) To the same effect, Mr. Liston observes,—"Disease of the lower jaw is by no means uncommon in consequence of a bad state of the teeth. These are overlooked and allowed to become carious; they break away perhaps, and leave a ragged stump, which, after lying dormant for some time, causes at last irritation and inflammation of the sockets, and thus lays the foundation of more extensive mischief—such as abscess of the jaw, necrosis of the alveolar processes, &c." ("Lancet," 1844, vol. i., p. 170.) Again, in his Papers on the Tumours of the Mouth, Mr. Liston unhesitatingly refers the osteo-sarcomatous and fungous tumours, which affect alike both jaws, to decayed teeth and alveolar irritation, as the most frequent causes; and, alluding to the fleshy growths which form at the fangs of unsound teeth, further remarks, "it is not unlikely that many of the more solid and less malignant diseases, involving the upper and lower maxillary bones have a somewhat similar origin."

of parts, occasions what may at first be regarded as a secondary affection of the osseous structure of the jaws and their lining membranes, which at length take on a state of idiopathic inflammation, that sooner or later ends in suppuration.

In some instances the disease assumes a more acute form, and is accompanied by considerable tumefaction of the soft parts, occasionally forming a considerable abscess, the matter of which is ultimately discharged, and the malady then assumes a chronic character.*

In the latter state, the disease may proceed in a very gradual manner for several years, during which it now and then changes from the chronic to the acute state, accompanied by inconsiderable pain, and giving little warning to the patient, or even to the attending surgeon, of the dangerous extent to which it has advanced. The matter being constantly, partly absorbed and partly discharged, either through the sockets of the dead roots or teeth, or through some small perforations in the external structure of the alveoli, and then carried off with the saliva, the malady, while it causes a considerable destruction of the parts affected, for the most part maintains its chronic state, and proceeds without changing much its external appearance, except as may regard the occasionally increased swelling of the gums and cheeks. The removal of the tumefaction in the soft parts, which generally follows the more convenient discharge of the matter, greatly adds to the deceptive character of the disease.†

* This more active inflammation, however, sometimes does not subside till the vitality of the part of the maxilla more immediately involved is destroyed, and a sequestrum of bone produced, which must be removed by exfoliation. The frequency of the occurrence of necrosis, independently of external injury, in the jaws, compared with other bones, is very remarkable, and quite unaccountable, except as arising from causes connected with the diseases or irregularities of the teeth. Indeed, it has been remarked that this species of necrosis seldom takes place after the age of thirty but in the jaw-bones.

† From the structure of the upper jaw-bone, and the extensive cavity which it contains, a ready lodgement is afforded for the matter which is formed, and thus there results, in addition to the infiltration and tumefaction that attend the disease in other parts, the complication of engorgement of the maxillary sinus—a circumstance demanding particular attention, as being sometimes one of the most distressing symptoms of the complaint. The natural vent by which the matter escapes from the antrum, is generally a sinus situated by the side of one of the small grinders, or in the anterior wall of the antrum. Expansion of the cavity is by

In some rare instances, a spontaneous cure may take place in consequence of nature timely removing the exciting causes, or the primary affection dependent upon them; but more commonly the disease at some period or other changes into a more violent stage, and becomes fistulous or otherwise complicated.

OF FISTULOUS PERFORATIONS AND ABSCESSES OF THE JAWS.

In this form of the disease, the lining membrane of the bone having not unfrequently been destroyed by the constant and protracted inflammation and suppuration, the absorbent vessels of the surrounding parts lose their energy and fulfil their offices very imperfectly, the cavity becomes loaded with matter, and the internal cellular structure, particularly if the under jaw be the seat of the disease, becomes more carious; the pus becomes very fœtid, has a greenish or blackish appearance, and is very acrid. Those parts of the jaw which are most acted upon by the chemical power of the matter, either from their situation, or from the nature of their structure, are gradually destroyed, the cheek becomes red and inflamed, and assumes an erysipelatous appearance.*

In the upper jaw, the matter generally perforates the outside of the gums, or makes its way below the cheek bone and through the outside of the cheek. See "Principles of Dental Surgery," cases 26 and 25.

In the under jaw, the disease very frequently first produces a

this means prevented, but the relief afforded is very partial, and the outlet so formed not being sufficiently free, distension to a certain extent continues, accompanied with much discomfort and suffering.

The lower jaw is frequently so much degenerated as to appear like a mere bag of matter, the cancelli and laminæ of the bone being penetrated and destroyed.

* Fistulous openings and sinuses are very commonly connected with carious or necrosed bone; and, indeed, diseased bone will generally be found at the bottom of fistulous openings. A curious instance of this occurring in the mouth, is narrated by Sir Benjamin Brodie, in his clinical lectures: "A patient once came to me who had a little ulcer formed over the symphisis of the lower jaw, which had resisted all methods of cure. I introduced a probe and found that it passed along a sinus which led up to the base of a diseased molar tooth, very near the angle of the jaw. The tooth was extracted, and the ulcer presently healed."—("Lancet," 1834-5.)

fistulous opening through the bony structure and gums; at a later period it perforates the under edge of the jaw, the matter forming an abscess under the chin, and being ultimately discharged externally.

By the partial removal of the pus the progress of the disease is again retarded in some degree, and considerable swelling prevented or removed; in this state it may proceed for a considerable time, even for many years, without the patient being sensible of his danger, so that even in this advanced state, he neglects to apply for proper surgical aid, especially if he belongs to the lower class of society, who are habitually inattentive to the cleanliness of the mouth, and apt, in accordance with their vulgar notions, to include all these diseases in the common expressions, face-ache, cold, or rheumatism of the face or jaws, or as the French term it, *un coup d'air* or *fluxion*, *&c.* See "Principles of Dental Surgery," case 24.

OF MALIGNANT OR CANCEROUS AFFECTIONS OF THE JAWS.

In advanced stages of maxillary affections, or when they are influenced by a weak or disordered constitution, the malady sometimes increases to an alarming degree, the mortification of the bones rapidly extending, and the inflammation and tumefaction of the surrounding parts becoming more or less augmented; and frequently such is the expansion of the bony structure, that the surrounding parts of the jaw-bone are enormously increased in size.

The constitution now necessarily suffers to a great extent, and if the disease be not arrested, the ulceration rapidly increases, and its destructive ravages are soon extended to other important structures of the mouth, as the palate, the fauces, &c.; at length inflammation is communicated to some important part, as to the brain, and thus becomes fatal; or the disease assuming a cancerous character, the unhappy victim ultimately sinks under its protracted and heart-rending progress. See "Principles of Dental Surgery," cases 4 and 27.*

* The form of carcinomatous disease here described is comparatively rare; that affection generally occurring in the form of a tumour of distinctive character at a very early stage. In its usual form, therefore, of carcinomatous tumour, it more properly belongs to the next section.

The following instance of carcinomatous disease of the mouth is particularly illustrative of this malady, not only in its last stage, but also in its origin and progress. The subject of it was a patient of St. Thomas's Hospital, under the care of Mr. Travers, who very obligingly afforded me every facility in repeatedly inspecting the disease, and ascertaining its pathological history as correctly as possible.

CASE I.

F. Onion, aged 56, entered the Hospital on the 3d of May, 1827; and the account which he gave of his case in the beginning of July, when I first saw him, was as follows:—

Although originally possessed of a robust constitution, as long as he could recollect, at least for the last twenty-five or thirty years, his mouth has never been healthy. He had many carious teeth, dead stumps and roots, but he rarely submitted to the extraction of a painful tooth, generally permitting it to rot away. His gums were diseased and inflamed, and he frequently suffered from gum-boils, swellings of the face, &c.

About six months previously to his entering St. Thomas's Hospital, he applied to a surgeon, in order to have a carious and troublesome molar tooth of the upper jaw extracted. It was at this time that he was informed of his perilous situation, of which he had previously entertained not the slightest suspicion. He was advised to enter St. Bartholomew's Hospital, where he remained for a short time under the care of Mr. Lawrence, but soon left that institution.

On examining his mouth, a truly appalling sight appeared. The greater part of the roof of the mouth, but particularly the right side and its posterior angle, with the velum pendulum palati was in a state of ulceration, extending about two-thirds of the semicircle of the maxillary bone, including all the alveoli of that side, and those of the cuspidati of the left side of the upper jaw.

The teeth of the affected parts, with the exception of a few small remnants of the roots of the incisors and cuspidati, had been partly destroyed by ulceration, and had successively dropped out in a state of putrefaction, and the few teeth remaining in the

upper jaw, and all in the inferior jaw, were very loose, encrusted with tartar, and tender.

The cheeks were but little swollen, but the glands of the lower jaw on each side were greatly enlarged and very hard to the touch. The affected parts, and, indeed, all the structures of the mouth were very tender, and the patient often suffered lancinating pains in different parts of the head.

The disease had evidently committed great and deep ravages in the affected structures, the external surfaces of which had a florid red appearance, and were covered with a tough, greenish, dark, and exceedingly fœtid matter, which was constantly discharged in considerable quantity.

The greater part of this matter, during a recumbent position of the body, was swallowed by the patient. When asleep he made a constant gargling noise, and his throat seemed to be frequently choaked up, being relieved only by swallowing the collected matter and saliva; and by this channel, as well as by absorption, the matter was without doubt led to affect the general system. It is by a consideration of this that we may, perhaps, best account for the following very curious and uncommon symptomatic phenomena accompanying this case, which, as taken in connexion with the maxillary disease, are particularly deserving of attention.

On the abdomen were two subcutaneous tumours, and at the lower part of the chest another; the latter of a round, the two former of a flattened and circular form, and about one inch in diameter; they were hard and firmly attached to the skin immediately covering them, which had assumed a blue appearance, but did not adhere to the parts beneath them; the two made their appearance about seven, and the other about three months ago. Formerly the patient enjoyed tolerably good general health, but for the last ten years he has been occasionally affected with gout and rheumatism; during the last three months, however, his constitution has appeared much broken; and when I last examined him, in the presence of Mr. Travers, he was so weak as to be hardly able to remain, for a few minutes out of bed, to afford the necessary opportunity for a minute examination of the local disease. It was then evidently in a malignant state, and every

hope of arresting the disease was abandoned. It is, however, not improbable, that had this case been attended to only one year earlier, the health of this unfortunate man might have been perfectly restored by the treatment I shall presently describe.

OF OSSEOUS, FIBRO-CARTILAGINOUS, SARCOMATOUS, FUNGOUS, AND OSTEO-SARCOMATOUS TUMOURS AND EXCRESCENCES OF THE JAWS.

Sometimes from some accidental excitement, or from a peculiar irritation produced by the osseous structure upon the periosteum, the membrane lining the cavity of the jaw, or the external periosteum and gums, during the progress of the diseases already described, large tumours or excrescences are formed on these parts. These tumours are either of a soft fleshy cellular structure, or of a fibro-cartilaginous and osseous kind, forming various sorts of exostoses, which seem to be equally common to both jaws.* When they occupy the upper jaw, they may some-

* As this treatise is not intended so much to be a descriptive account of the diseases of the jaws as a practical essay on their nature and treatment, it would be out of place here to enter upon the peculiar appearances and morbid anatomy of these tumours, which are, doubtless, familiar to the medical reader.

M. Andral is of opinion that it is useless to attempt to give particular designations to the infinite variety of appearances that may be assumed by the organisable morbid products, which are deposited in various textures of the body. The chief practical distinction usually now made, in respect to the forms of the disease under consideration, is that between the benign and malignant tumour. This is the division which Mr. Fergusson, in his clinical lectures ("Lancet," 1841-42, vol. i. p. 890) principally insists on. The malignant tumour he describes as rapid in growth and development, with a disposition to fungate, and want of defined limits after attaining a certain size—the neighbouring textures being seemingly involved in the disease, and the whole mass, at a very early period, feeling soft and pulpy, and in a more advanced stage showing all the appearances of the encephaloid tumour—and accompanied by that emaciated and unhealthy aspect of the patient, which so certainly denotes the presence of a carcinomatous affection. The reverse of all these are the characteristics of the non-malignant tumour. Dr. Walshe states that of the three varieties of carcinoma, the encephaloid is peculiarly "the cancer of the *upper* jaw." This author farther remarks that carcinoma of the maxilla occurs generally unassociated with cancers in other parts of the body.—(Walshe on Cancer, p. 560.)

Notwithstanding these apparently distinct characters, in practice it is no easy matter occasionally to recognise them. This difficulty is, however, of little real consequence, as regards the curative plan of treatment directed to the mouth, since that is equally applicable to every variety of the disease, and, unlike the

times be found to enter the nose and even the orbit of the eye, and by their gradual increase the cheeks become very much swollen as well as all the parts involved, great deformities of the face, distortions of the nose, the eyes, and other parts being the necessary consequences. Sometimes they will project into the nostrils and through the sockets of the eyes, actually dislodging the eye ball, which then protrudes in a most disgusting and hideous manner.

In the under jaw these tumours are often of a spongy or osteo-sarcomatous nature, and particularly disposed to extend to an immense size; sometimes they are accompanied by the formation of polypi in the ears, and discharges of matter from these organs. Notwithstanding their very formidable appearance, however, these diseases are neither more dangerous, nor less tractable under proper treatment, than those of the upper jaw.

If, however, under all these various complications, these maladies are not properly treated and completely arrested in their progress, they are liable to become cancerous, and thus terminate fatally; or by gradually weakening the constitution, and predisposing it to the influence of other diseases, eventually assist in destroying the unhappy victim. See "Fox's Natural History and Diseases of the Teeth," Plate vi, vii, and x. [No. 81 of the Appendix.]

The following case of Osteo-sarcoma of the lower jaw, taken from the "Lancet," is exceedingly illustrative of the statements I have made, and must be deemed highly interesting:

CASE II.

"William Cooper, aged 50, a vigorous and healthy looking man, states that about twenty years ago he had one of the molar

treatment by extirpation, is not attended by any of those effects, such as shock and the more permanent impression made on the vital powers by the process of extensive cicatrization, which, of necessity, immediately follow an operation like excision of the jaws, and demand calculation on the part of the surgeon. It will generally be found that the farther these tumours are removed in structure from that of healthy bone, the more liable are they to take on malignant action.

The symptom which first attracts the attention of the patient is usually a slight swelling of the gum, sometimes compared to the cutting of a wisdom tooth, and generally regarded as an affection of the gum only, though in reality arising from a morbid condition of the alveolar ridge. In this early form, the disease, when seated in the front part of the mouth, is often described under the term Epulis, as a peculiar affection.

teeth extracted from the right side of the lower jaw." [This tooth must have been extracted with considerable violence, or, what is more probable, have been broken and the stump, or part of its roots, been left in the socket.] "Two months after, he perceived a small nodule, which was produced from that part of the alveolar process whence the tooth had been drawn. It imperceptibly increased in size for several years, but its progress was unaccompanied by pain. To the best of the man's recollection, sixteen years after the appearance of the nodule, the two remaining molares of that side became loose, and eventually dropped out. He then, for the first time, discovered a hardness extending from the bicuspid tooth of the same side backwards, to the ramus of the mylo-hyoid line; occasional pains attacked the part, yet he did not seek medical aid. In the month of June last, a swelling began to manifest itself externally, which, taking the direction of the man's finger for our guide, occupied the space intervening between the right ramus, and the anterior edge of the masseter muscle; there was occasionally severe pain extending upwards to the side of the head. He applied at this period to a medical man in the country, whose advice gave great consolation. He desired him to apply a bread and water poultice, and gave him to understand he would expedite the cure in a week. Both patient and doctor were deceived, however. Finding no relief, and fancying Galen rather out in his prognostics, he withdrew himself altogether from the benefits of 'sound chirurgical.' In the month of October last, he fell, and struck the part against the shaft of a waggon: considerable bleeding took place into the mouth. A fortnight after the receipt of the blow, the tumefaction sensibly augmented; the pain became more severe, and of greater duration, and towards the end of December, exfoliation of a small portion of bone took place, close to the bicuspid tooth, which was followed by temporary relief. The swelling continued to increase up to his admission into the Hospital, on the 4th of February last. On examination, the disease extended from the angle along the ramus of the right side, as far as the cuspidati, and thence backwards to the basis of the tongue. A concavity of about an inch in depth, occupies the vacant alveolar process, extending from the bicuspid tooth to the ramus of the mylo-hyoid

line. The swelling has a firm cartilaginous feel; the glands of the neck appear free from disease, and likewise the integument covering the diseased bone. A portion of bone being felt in the hollow, a pair of dressing forceps were introduced, and the fragment extracted. Since the removal the patient has experienced little or no pain: an occasional fœtid discharge takes place. As the jaws will not admit of a wider separation than merely to admit a small finger, mastication is performed with much difficulty." See the "Lancet," vol. xi. p. 747.

OF THE TREATMENT OF THE DISEASES OF THE JAWS.

If the foregoing description of the maladies of the jaws and of their causes be correct, it requires but common sound judgment to decide on the proper treatment. It is necessary, however, to abandon all old prejudices and practices, resulting from an insufficient acquaintance with the subject, and to prescribe those remedies which are as simple and rational as they are certain in their salutary effects, and which are founded on a perfect acquaintance with the natural history and pathology of the parts affected—the latter of which seems to have been insufficiently known, and for the most part not understood by those authors who have hitherto written on this disease, with whom I am acquainted.

Although the principles of treatment of the several diseases described in the preceding pages, which are, in fact, but different forms and stages of the same malady, do not materially differ, still they admit of considerable variation in the extent to which they may require to be carried; I have, therefore, thought it best to give a separate account of the curative means, which are indicated for each particular disease, in the same order as I have described the diseases themselves; and I shall now proceed to give the necessary directions, and lay down the rules for that curative plan, which, under my experience, has seldom failed to effect a perfect cure, even in such cases as have advanced to a considerable extent.*

* The scope and object of this essay do not, of course, admit of any descrip-

OF THE TREATMENT OF INFLAMMATION AND SUPPURATION OF THE JAWS.

The first and most important indication of treatment in this affection is, to remove from the maxillæ and every part of the mouth, whatever cause of irritation may have produced, or may tend to keep up the inflammatory action. This may generally be effected by the extraction: 1st, of every dead root and tooth; 2nd, of every tooth suffering from complicated caries, or every painful tooth; 3rdly, of every large grinder which is deprived of its antagonist;* and, 4thly, of every other tooth which is loose, irregular, or situated in any part primarily affected, or in any way capable of acting as a cause of irritation and excitement upon any part of the mouth, or which might be in the least suspected to interfere with the exfoliation of the dead parts, or with the complete removal of them.†

tion being given of the operation of excision of the maxillary bones, which it may be necessary to have recourse to in the advanced stages of the disease; the aim of the author being solely to give an account of the curative treatment within the reach of dental surgery. These operations belong to general surgery, and will be found fully treated of in the works of surgical writers.

* In regard to the third head, namely, the extraction of every large grinder deprived of its antagonist, the author has been very much misrepresented, having been made to appear as recommending that measure in every case, not only as a means of cure in secondary affections, but as a measure to be adopted for the remedy of the simple defect of the want of such opposing grinders. The author has never in any of his publications recommended the extraction of the grinders or other teeth when their antagonists are lost, except as a part of the treatment of the secondary diseases of the sockets and jaws. The principle on which he proceeds in these cases, in regard to teeth so circumstanced, is the necessity of removing all sources of excitement—being the same which suggests the extraction of dead and loose teeth. That excitement is the result of the want of antagonist grinders is proved by the fact, that teeth in these circumstances are gradually protruded along with their sockets. A certain amount of action is necessarily generated by this process, and the action thus produced in a mouth overrun with disease, is very ready to assume the character of irritation. It is on this account that it becomes expedient to provide for its removal.

† This may appear very severe treatment, but it is not really so, especially when considered in connexion with the serious nature of the disease, and the very extensive operation, which is the only alternative, failing curative treatment. All the above dental operations consist of measures calculated to second nature, and are, in this respect, based on the same principles as the operations of general surgery for the removal of foreign bodies, sequestra of bones, and certain products of morbid action. In the case of every tooth specified above, it will be found, on minute inspection, that nature has commenced, at one point or

All the teeth and roots which constitute the causes of the disease should be removed, if possible, at the same time—for a removal at different intervals will greatly diminish and protract the salutary result of the treatment.* This, however, may frequently be deemed impossible, and the dentist must content himself with their removal at different periods. Any treatment, however, without the removal of them altogether, at least in a short space of time, will only be an injurious palliation, and occasion a relapse of the disease, sometimes more violent than the first attack; for the remaining affected teeth will keep up the morbid action, and either lessen or totally prevent the healthy inflammation of the whole mouth, but especially in the parts most extensively affected.

other, the process for throwing it off as an offending body—thus furnishing an indication which cannot, without risk, be overlooked, even in comparatively healthy mouths.

But since the introduction of the Inhalation of Ether, the mere pain of an operation can no longer be regarded as a barrier to its endurance, even by the most timid. In most instances, the ether is neither asked for nor required in the extraction of a single tooth, but, in those more serious cases, in which the mouth contains many stumps and roots of teeth, there are comparatively few patients who have not a strong desire to be put under its influence. Of all the parts of the body, the mouth is the least suited to prolonged surgical operations under the influence of ether, because it is by that organ the substance is administered: consequently, the inhalation of ether is almost precluded in the operations of general surgery on the mouth and jaws. But, as the operations of dental surgery are of a nature to admit of interruption, and may be divided into several stages, or even, if necessary, into different sittings, this agent can always be made use of by the dentist, unless when contra-indicated by some peculiarity of constitution or condition of body. From this circumstance it also happens, that the chances of evil effects from the use of ether by inhalation are very much diminished, as it is never necessary to prolong the administration of the vapour after the state of insensibility has been induced; and, indeed, if no impediment occur, such as the forcible shutting of the mouth, an operation extending to the extraction of many stumps may sometimes be completed before the patient recovers from the effects of a single dose.

It is to be hoped that the immunity from pain, which may now be enjoyed by the use of ether, may prove of signal service to scientific dental surgery, as contra-distinguished from that school which regards the extraction of dead and decayed teeth in the light of *killing the goose that lays the golden eggs.*

* From neglect on this point, the above treatment is liable to fall into discredit. Cases have come within my knowledge, in which all the teeth have been successively extracted, without any mitigation of the disease. It is obvious, that the mode of applying a remedy is as necessary to the securing of its proper effect, as is its possessing the right nature and properties. The unsuccessful result of half measures, and dental operations, such as extraction, undertaken on no fixed principles, and often at the suggestion and under the direction of the patient himself, is exhibited in several of the cases contained in the Appendix.

Whereas, a perfect removal of these causes, followed by the greatest cleanliness of the mouth, will frequently effect a cure without any further operation.*

* Dr. Harris of Baltimore, who is one of the editors of the "American Journal of Dental Science," and author of the "Principles and Practice of Dental Surgery," in his "Dissertation on the Diseases of the Maxillary Sinus," furnishes an excellent illustration of the truth of this remark, in the history of one of the cases treated by him. A young lady consulted Dr. Harris on account of a painful throbbing tumour on the cheek, over the first right molar tooth, which had commenced eighteen months previously. She had several decayed teeth on the affected side. After examining the state of the cheek, Dr. Harris ordered four leeches to the painful part, to be followed by an anodyne fomentation and a pediluvium at bed-time. On the day following the pain in the cheek was relieved, but more minute inspection showed that the gums were spongy and inflamed, and the first right molar sensitive to the touch. On the second day a discharge of matter took place from the nose, proving that the maxillary sinus was in a state of engorgement. The first superior right molar was now extracted, for the purpose of evacuating the antrum, and its removal permitted the escape of a quantity of bloody pus. "I urged upon the patient," says Dr. Harris, "the importance of having several other decayed teeth removed, *though not as necessary to the cure of the affection*, to which she had been subject, but she would not submit to the operation."

During thirteen weeks Dr. H. persisted in the ordinary treatment by perforation of the antrum and injections, without the smallest benefit. Thrice the opening in the alveolus was allowed to close, and as often it had to be re-opened, on account of the accumulation of matter. At last measures were adopted to remove the exciting cause. "Suspecting," says Dr. H., "that the diseased condition of the teeth, gums, and alveolar processes beneath the cavity exerted a morbid influence upon it, I, a second time, urged the removal of the first bicuspis, and the second and third molaris, which were all so much decayed as to render their restoration out of the question." The result was a perfect cure.—("American Journal of Dental Science," vol. iii., p. 106.) Here is trifling truly! Dr. Harris, after three months of painful and injurious delay, discovers that the removal of the decayed teeth in the immediate neighbourhood of the affected part was necessary to the cure of the disease! I have no doubt but that by that time the patient herself had also made the discovery.

Even Mr. Thomas Bell, whose authority is deservedly so great among his professional brethren, appears to consider the extraction of the teeth and stumps, which are the local exciting cause of the disease, as an unimportant part of the treatment. According to this author, the treatment consists of—1st, the evacuation of the antrum by the introduction of a trocar. 2nd, the correction of the diseased condition of its lining membrane by the injection of various stimulants. 3rd, the removal of caries bone—the product of the disease.—("Anat. Phys. and Diseases of the Teeth," p. 261.)

In all Mr. Bell's cases decayed teeth were the cause of the disease. He does not hesitate to state that the affection under consideration almost invariably proceeds from that cause, but in the treatment of the cases he records, the removal of all dead teeth and roots was only put in practice after a long course of ineffectual treatment. The necessity of this measure is also entirely overlooked by him in stating the indications to be fulfilled by the treatment; and the cures which took place under his care are attributed to the perforation and injec-

The second indication is, to procure the most favourable discharge of the matter, and promote the healthy action of the parts

tions rather than to the removal of the exciting cause of the disease. Yet by his own reports it is evident that no progress was made in the case till after the exciting causes were removed. The tedious and ineffectual treatment detailed by Mr. Bell at pp. 234—7 of his "Anat. Phys. and Diseases of the Teeth," exhibits a strange neglect of one of the first principles of surgery, namely, the paramount importance of removing exciting causes.

The efforts of the surgeon in this disease, especially when it affects the antrum, are generally too exclusively directed to evacuating the matter confined in the maxillary cavity and acting upon its lining membrane by stimulants. Confinement of matter in the antrum is, undoubtedly, the immediate cause of the enlargement of the parts, but it is no more the real origin of the disease than is confined matter in any other position, when occasioned by the presence of a foreign body, the cause of the attendant suppurative inflammation. This is dwelt on by most writers as affording the first and principal indication, whereas it is clearly secondary. In respect to injections, as an auxiliary to the operation of perforating the sinus, no great reliance is to be placed on them, as is very evident from the progress of Dr. Harris's case, as well as from Sir Benjamin Brodie's observations on the subject. The latter of these gentlemen relates two cases in which a discharge from the antrum continued during life, notwithstanding the persevering use of injections, and he states that "in some cases the patient recovers perfectly after the operation and in others not."—("Medical Gazette," vol. xv., 1834.)

The whole treatment of the elder surgeons may be comprised in this one sentence from Mr. Benjamin Bell's "System of Surgery," vol. iv. p. 521:—"In the treatment of abscesses of the antrum maxillare, nothing will accomplish a cure but our giving a free discharge to the matter." Modern surgeons, however, pay more attention to the true nature of the disease, and consequently do not neglect the removing of the local exciting causes of irritation; but it must be confessed that few of them have any knowledge of the effects of a thorough dental treatment, and that they are generally but too ready to press upon nature the services of the knife. Mr. Lawrence, in speaking of the morbid irritation resulting from affections of the teeth, says:—"In cases where pain or uneasiness may be experienced about the jaw, it is expedient to pay close attention to the state of the teeth and gums —to examine them carefully, to see that they are in a sound state; or, if not, to take care that any decayed or rotten stump should be removed, so as to take away the irritation; or if the gums are found in the condition that I have mentioned [spongy, detached from the teeth, and discharging purulent matter], to take care that suitable means be put in practice by the dentist to put a stop to the disease."—("Medical Gazette," 1830, p. 456.) Mr. Liston's precepts in regard to the treatment are:—"You take out whichever tooth is decayed—perhaps one large or two small grinders—and all the stumps that are present, with the view of relieving the irritation, getting more readily at the antrum, and making a sufficiently large opening." "There can be no doubt as to the propriety and absolute necessity of taking away all sources of irritation as a preliminary step to operations of any kind on this cavity."—(Lectures in "Lancet," 1840—1.)—Mr. Fergusson takes much the same view of the treatment, but he speaks less decidedly of the removing of the sources of dental irritation. Before perforating the antrum, "it will be best," he says, "to extract any stumps or diseased teeth immediately below, as possibly the inflammation and suppuration may be at the root of a fang. With stumps removal should be immediately resorted to; but if a tooth be sound, or tolerably so, it may be a question as to whether it should be removed or not. If there is great tenderness on pressing upwards, it should be extracted."—("Practical Surgery," p. 480.)

affected, by the adaptation of such means as are consistent with correct surgical principles. As a more distinct illustration of the above treatment, I beg to refer the reader to the cases 3, 4, and 5, in the sequel to this essay.

CASE III.

Captain M——, of the East India Company, from Calcutta, laboured under a most distressing and complicated affection of the mouth, the effect of an unparalleled abuse of mercury, which had been exhibited only eleven months previously.

He came to England, on leave of absence from his regiment, to seek for surgical advice; and having visited Mr. Lawrence, June 11th, 1826, soon after his arrival in London, that gentleman requested him to consult me immediately.

The patient was a tall, well formed, handsome young man, about twenty-one years of age. According to his own statement, his health was originally excellent, and his constitution strong, and only one year previously he was in the possession of a complete set of teeth, which, with all their contiguous parts, were perfectly sound, regular, and beautiful. This was still evident,

After what has been said, it must be sufficiently obvious, that the treatment laid down in this essay consists mainly in removing *completely and thoroughly all the local sources of irritation, in whatever form they may exist, as a means of cure*, and not as a preliminary to other operations, and the adoption of measures for maintaining the mouth free from tartar and other primary causes of the diseases of the teeth and sockets.—(See "Principles of Dental Surgery," Part ii., Chap. 3.)

It is much to be regretted that it was found impracticable to give an account, which would be at all satisfactory, of the results of the various modes of treatment recorded in the collection of cases in the Appendix. In the cases operated on by excision, the reports are frequently not carried down beyond the day of operation, so that their sequel remains unknown. Had we, however, been in possession of a complete account of the results of the cases treated by excision, it is evident that a comparison of them with the cases treated otherwise, would appear far from impartial, as they consist principally of the worst cases—such as are not unfrequently too far advanced for curative treatment, and have already been the subjects of unsuccessful measures, seldom or never recorded. But, indeed, no just comparison can be instituted between excision, and other means, such as dental treatment—the one necessarily involving incurability, and the other being essentially of a curative nature. Recovery from the effects of the extirpation of a part, though it terminate successfully, cannot be regarded as the cure of a disease. The operation of excision, by removing the whole of the parts affected, leaves to nature to accomplish simply the process of cicatrization; but dental treatment, in stimulating nature to overcome the disease, is truly of the nature of a cure.

from the appearance of the remaining parts, which, even in the morbid and dead state, evinced the most striking evidence of their former perfection.

All the teeth, although entirely free from caries, or any disease of their bony structure, were now perfectly dead, and only mechanically held in their sockets. The periosteum was also totally destroyed, either by absorption or corrosion. The alveoli were not only dead, but in a state of putrefaction, their upper edges all around the semi-circle of the mouth being from an eighth to a quarter of an inch exposed, and exhibiting, from their cadaverous appearance, a very frightful aspect. The gums were partially destroyed, and the remaining portion of them either gangrenous and sloughing, or in a state of inflammation and suppuration. The disease had already extended to the maxillary bones, and their osseous structure, as well as the periosteum of their cavities, was more or less under the influence of inflammation, suppuration, and mortification; but more especially the left side of the upper jaw, which was already much increased in size, accompanied with a correspondent swelling of the cheeks. The face was flushed, and the skin had a bloated erysipelatous appearance, and the patient suffered excessive pain of the whole mouth, the jaw-bones and other parts of the head, as well as of other more remote parts of the system.

There was a constant flow of viscid ropy discharge from the mouth, like that of great salivation, mixed with greenish matter, and accompanied by a fœtid cadaverous odour, emanating from this fluid and the dead and morbid parts, and so exceedingly offensive as to be almost insupportable to the bystander.

The malady was also particularly complicated, as well as highly aggravated by a great many adhesions of the muscles of the jaws, which had taken place during the excessive salivation previously mentioned, in consequence of which, the unhappy patient had lost almost all power of moving the under jaw. From these causes, the teeth were mechanically pressed into their dead sockets, and by this unnatural and permanent pressure, the absorption and exfoliation of the sockets were greatly retarded, and the immense irritation already produced by the dead teeth and sockets upon the gums and other soft parts highly augmented,

not to mention that these adhesions particularly impaired the enunciation of the patient.

In addition to these evils, this almost complete closure of the mouth and teeth had for a long time prevented the patient from taking solid food, and indeed hardly admitted a sufficient quantity of fluids to preserve his deplorable existence, especially during a long and tedious sea voyage; an evil which would have been nearly destructive to the patient, had it not been in some degree lessened by the removal of one of his incisors. He laboured under excessive debility and nervous irritability, accompanied by fever and general emaciation; in short, his health had suffered to such a degree, that his life might be regarded as being in a most precarious state.

TREATMENT.

The principal indication of treatment in this interesting case, was evidently to relieve the inflammation of the surviving osseous and soft structures, by promoting the exfoliation of the carious sockets and other bones, and more especially, by removing all the dead teeth. These operations, however, were rendered particularly difficult and painful by the fixed state of the under jaw; to this the great debility of the patient added another very considerable obstacle, notwithstanding his surprising fortitude. The following treatment was adopted.

June 12th, 1826. Seven dead teeth were removed, and the patient directed to wash his mouth frequently with a mixture of tincture of myrrh, honey, and sage tea.

June 16th. Two dead teeth were extracted, and the use of the lotion continued. The patient's health and strength were already improving, and by the extraction of his front teeth, he was enabled to take more nourishment.

June 19th. Four teeth more were removed, the health of the patient still continuing to improve. Some parts of the sockets had come away by exfoliation. The patient complained of pain in the jaws.

July 7th. I found our patient almost recovered and in excellent spirits. Mr. Lawrence, who had seen him a few days previously, had taken away the greater part of the remaining

teeth and sockets, which had become so loose as to be removed without much difficulty.

Aug. 11th. Captain M. visited me to state that all the remaining dead teeth and sockets had been removed some time previously by Mr. Lawrence. His health had much improved, and his mouth was healing very rapidly. His speech, however, remained very defective, a misfortune principally owing to the almost total loss of motion of his under jaw. He intended in a few days to depart for Ireland, to visit his relations and friends, and to return, after some time, to submit to the necessary operations to cure the adhesions of his mouth, agreeably to the advice of Mr. Lawrence, and then to supply the deficiency of his teeth by a double set of an artificial masticating apparatus.

OF THE TREATMENT OF FISTULOUS ABSCESSES OF THE JAWS.

A similar treatment to that which has been already recommended in cases of simple inflammation and suppuration is applicable to fistulous abscesses, especially if the affection be seated in the upper jaw; for, by the removal of the injurious teeth, a convenient and sufficient outlet for the matter will be invariably obtained, and every external opening of the face will be readily closed by the requisite surgical management; and a perforation of the partition between the antrum and the nose, or any other part of the maxillæ, will not only be unnecessary,* but will always form an artificial cause of aggravation, and tend to retard the recovery of the affected part.†

* In the advanced form of disease treated of in this section, I believe that the extraction of the affected teeth which are in the immediate neighbourhood of the antrum, will always afford a sufficient opening for the discharge of the matter; but in cases which might, in the course of treatment, prove exceptions, the ordinary means are to be employed to make an opening, care being taken that, at all events, it be sufficiently large.

† If any portion of the bone be in a state of necrosis, attention must, of course, be directed to facilitating the separation of the sequestrum. The use of instruments may be required to bring away the loose portions of bone, and in some cases it will be necessary to enlarge the existing openings.

Should the malady, however, be seated in the lower jaw, and so far advanced as to have already penetrated its under edge, it will be sometimes necessary to allow the matter to escape externally through the parts best adapted to the situation of the diseased structures and cavities. The mouth should be washed six or eight times a day with a mixture of tincture of myrrh and honey, diluted with sage tea, and the cavity cleared twice or thrice a day with a lock of cotton, or a very soft brush of bristles, sufficiently soft and long to clean it without occasioning more than a gentle irritation, previously dipped in the above mixture or warm water.

The usual method of retaining cotton or lint in the diseased cavity seems to me to be rarely applicable, and from the peculiar structure, situation, and functions of the parts, injurious in most cases, as it not only interferes with the free discharge of the matter, but also prevents, in some measure, the cleansing and salutary effects of the mixture and of the saliva, both of which act as a constant emolliating stimulant upon the morbid parts.

The general state of the constitution should be attended to, and in particular the functions of the alimentary canal; such medicines, however, should be carefully avoided as have a tendency to act disadvantageously upon the glandular, or osseous system.

To preserve the necessary constitutional strength, a wholesome and nourishing diet, free from undue stimulant and irritating properties, is of the greatest importance. It should principally consist of bread, or farinaceous preparations, and broth, or a proper quantity of easily digested animal food, as beef, mutton, game, &c.; as a beverage, tea or toast-and-water may be taken with advantage, but all fermented liquors should be entirely avoided, and spirituous drinks, as brandy, &c., taken in very moderate quantities only; the patient should be directed to keep his mind and body as tranquil as possible, to take exercise, but to avoid fatigue and to guard particularly against exposure to great heat or cold.

The above treatment, I believe, will seldom fail to ensure a successful result, even when applied at an advanced stage of the disease: it must, however, be well considered, that the removal of a malady, of from five to twenty years standing, cannot be obtained

suddenly, but by a gradual process; and it is obvious that any enlargement, especially of the bony structures, can be removed only by a gradual increase of the natural energy of the parts, and by considerable efforts of the constitution proportioned to the previous gradual increase of the malady.

OF THE TREATMENT OF MALIGNANT OR CANCEROUS AFFECTIONS OF THE JAWS.

Even in this aggravated state of the malady, if it has not extended its ravages to the important organs connected with the upper jaw, and if the constitutional strength of the patient has not been much reduced, a perfect cure may not unfrequently be obtained by a judicious adoption of the remedies already enumerated.*

In those cases, however, in which the malady has proceeded to so great an extent, as to render the above mode of treatment, and the energetic application of these general and local means insuffi-

* When these measures are properly carried out, the patient has had every chance given him, but not otherwise. Unfortunately, however, this is seldom or never the case, for when the disease is considered of a character at all malignant, and, consequently, unfit for the operation of excision, the patient is generally allowed to die with his mouth still retaining the exciting causes of his dreadful malady.

The following case, extracted from one of the surgical journals of the Glasgow Royal Infirmary, affords a melancholy example of this neglect of remedial measures:—"Thomas Alcorn, aged sixty. Springing from alveolar process of right side of upper jaw, is a soft spongy tumour. It extends from the first bicuspid tooth to the last molar, and is nearly twice the size of a common walnut. It lies principally on the external surface of the alveolar process, but a small portion of it passes to the internal surface. It is partly of a pale red and partly of a dull red colour, and is dotted with numerous whitish spots, some of which are slightly elevated above the surrounding surface. The first molar tooth has been removed, and the probe passes to the bottom of its socket without feeling rough bone. Second molar also partly removed, but root still remains. The two bicuspid teeth are loose in their sockets; but the last molar tooth remains firm. Has occasional darting pain in tumour. Is subject to tooth-ache, and several of his teeth are carious. First observed tumour three months ago, then about the size of a pea, and *seated over the socket of the first molar tooth. First and second molars were loose before the appearance of the tumour, and had been frequently the seat of tooth-ache.* In this case, there was no operation, as the patient was phthisical, and apparently in a dying state."—("Journal of Wards, Nos. vii. and xii.," 28th May, 1829.)

cient, it is to be feared that every other mode of treatment, including amputation itself, will be of no avail, but rather tend to accelerate the fatal termination of the disease. See cases 4 and 27 in "Principles of Dental Surgery."

OF THE TREATMENT OF OSSEOUS, FIBRO-CARTILAGINOUS, SARCOMATOUS, FUNGOUS, AND OSTEO-SARCOMATOUS TUMOURS AND EXCRESCENCES OF THE JAWS.

The management of these complicated forms of maxillary disease should generally be the same as that already recommended, although it may often require to be carried to a greater extent, and the additional application of surgical operations; for such tumours and excrescences must be considered as consequences, and not as causes of the affections of the jaws.

In such cases it is particularly requisite that all the teeth should be removed from those parts of the jaw whence the disease originates, and from both sides of the tumour, so far as the bony structure of the maxilla is morbidly affected, even though they should be perfectly sound in their bony structure. And it is hardly necessary to add, although it is of no small importance, that the utmost care should be observed to use the least possible violence, and to cause as little irritation and pain as possible in performing all the dental operations.

If the diseases should be accompanied by œdematous and sarcomatous tumours, the restoration of healthy action, by the perfect removal of the morbid causes, combined with the other measures recommended, will not unfrequently cause them to be removed without any other operation; should nature, however, not be sufficiently active in her curative efforts, they may be extirpated either by the knife, forceps, or scissors, without any danger of a recurrence.* Should the tumour be of a spongy or osseous na-

* The most familiar example of these tumours is the affection called Epulis, and to it these remarks particularly apply. Sir Charles Bell used to insist very strongly, in such cases, on the necessity of removing the alveolar processes, as well as the teeth and enlarged gum, because these three parts are very intimately connected. In his lectures, delivered at the College of Surgeons, his words were:—

ture—osteo-sarcoma or exostosis—I would advise that it should not be interfered with until it be found that nature is unable to remove

"I am now about to press upon your attention a most important consideration; that is, that these three parts—the teeth, the alveolar processes, and the gums—are one in natural constitution, and consequently one in disease. When tumours arise by the side of the teeth, you will do well to recollect, that unless on removing the tumour you also take away the tooth, gum, and alveolar process, you leave parts which are disposed to renew the disease, and you do not in effect eradicate the tumour."—("Lancet," 1833-4, vol. ii., p. 216.)

This observation, as to the close relation of the gum, tooth, and socket, is a very valuable one, but in a practical point of view, its importance depends on which of the three is to be considered the part primarily affected. What has already been said regarding the causes of the affections of the jaws, has, I should hope, made it sufficiently clear that the teeth are the structures originally at fault, and not the alveoli. It is obvious that, on account of the close connexion subsisting between these parts, if that which is the origin of the mischief be retained, the associated parts will remain disposed to renew the disease; but on the contrary, if the offending member be disconnected with the others, these will naturally resume their wonted state of quiescence.

It is to the teeth, then, that our measures must be principally directed. The extraction of such of them as are embraced by these tumours, with due attention to other sources of excitement, is of itself sometimes sufficient for a cure; while every other operation invariably fails when not accompanied by the removal of the structure which was the original seat of the primary disease. "In order," says Mr. Liston, "to extirpate effectually any morbid growth proceeding from the investments and roots of the teeth, these must first be extracted. There is no use in attempting to remove the tumours otherwise."—("Operative Surgery," fourth edition, p. 300.) We find Mr. Thomas Bell also giving his testimony to this fact, as the result of his practice. "The simple excision of this kind of tumour," he observes, "is rarely successful. I have generally found that, however perfectly it may be taken away with the knife, if the loosened teeth be suffered to remain, a few weeks only will elapse before it makes its re-appearance."—("Anat. Phys. and Diseases of the Teeth," p. 234.) On the other hand, I can assert with confidence, that no one was ever disappointed in the result of that treatment, which is based on a thorough removal of all the local exciting causes of disease. A very interesting proof of the truth of this assertion is furnished by the following case, published by Mr. Koecker, in the "Medico-Chirurgical Review," No. lxxv., for January, 1843.

"Mr. Atlee, of Ealing, about sixty years of age, originally of a very robust constitution, had for nearly thirty years been a great martyr to the gout, for which he had taken various powerful medicines with only temporary enefit; he also frequently suffered from severe pain in the ears, and his hearing had become very defective. The patient was then under the care of Mr. Dickenson, of Ealing, and on consultation with Mr. Lawrence, the latter gentleman advised my being consulted.

"On the 30th August, 1840, when I visited the patient, he had been bedridden for six months, and was reduced to a state of great emaciation and debility. On examining his mouth, it presented a most forbidding appearance; all the teeth blackened or discoloured, and much furred with tartar, were imbedded in, and surrounded on all sides, by an irregular fungous and partially ulcerated mass of a deep-red, almost livid appearance, extending above half an inch on both

it, or until the general healthy action of the mouth, and the whole system shall have been to a certain degree restored, after which it may be extirpated by the most convenient surgical means.

In the Essay on Exostosis, contained in that very valuable and practical work, entitled, "Surgical Essays," by Sir A. Cooper,

sides of the teeth, and half an inch deep. The whole mouth was in a state of great inflammation, especially the diseased parts, and excessively painful, even to the slightest pressure of the tongue, and his breath was excessively offensive. The fungous excrescences in many parts extended beyond the chewing surfaces of the teeth, and hence any attempt to close them occasioned agonising pain, in consequence of which the sufferer was totally unable to take any solid food. The patient was still in possession of nearly all his teeth, and with the exception of one or two of them, they were all, as far as I could ascertain, sound and firm in their sockets; but my experience having taught me that such a state of the mouth generally arises from a diseased condition of the roots of the teeth or their sockets, and other osseous structure of the jaws, I gave it as my opinion that the removal of the diseased mass alone would be the far more painful operation, and still be productive of only temporary relief; and as the condition of the patient permitted of no delay or doubtful treatment, I proposed, in preference, to commence by emancipating the diseased mouth from the immediate cause of irritation, namely, all the teeth, and afterwards to remove the excrescences.

"Mr. Lawrence and Mr. Dickenson perfectly agreed with my views, and the patient himself earnestly requested that the most speedy remedy should be adopted, at the same time urging the immediate performance of the operation. By the assistance of some of his family he was placed in a chair, and in the course of ten or fifteen minutes I removed twenty-nine teeth, the extraction of which he bore with the most extraordinary fortitude. Being replaced in bed, he stated that he already felt somewhat relieved from his sufferings. It may be necessary here to remark, that such an operation must be performed with the greatest care and judgment, as it is not improbable that, in the ordinary mode of removing teeth, the strength of the patient would have failed, and he could not have borne the extraction of so many. On inspecting the teeth I found, as I had anticipated, that many of them were diseased, some affected with caries, some with denudation of the periosteum and sockets, and some with exostosis in various stages.

"Eleven days afterwards I removed all the fungous growths with strong scissors of different forms, and having requested to be informed of the progress of the case, and receiving repeated information that the patient was rapidly improving in health, I did not deem it necessary to see him again.

"Nearly two years afterwards I visited Ealing, and calling at the house of my patient, I was introduced to a robust, tall, healthy-looking old gentleman, whom I certainly should not have recognised as my patient. His mouth I found to be in a perfectly healthy state. He could masticate well, and articulated with so little imperfection, that his loss of teeth would not have been noticed. He has long been able to resume his public duties as parish-clerk. He stated that since the operation he had been free from any attack of the gout requiring medical attendance; he had not suffered from the annoying pain of ear-ache, and his hearing was perfectly restored; and such was the excellent state of his health, that though he had reached the age of sixty-two, he confidently expressed his conviction that he should 'get rid' of the gout altogether."

Bart., and B. Travers, Esq., page 192, the opinion of Sir Astley so entirely corresponds with my own, that I cannot resist the gratification of making use of his own words.

"As to the treatment of this disease," he observes, "it consists in first seeking the source of irritation, and removing it when discovered, in order to prevent the further progress of the disease; and indeed, it may be probable, that the removal of the source of irritation might sometimes, even when the disease has advanced to a considerable extent, succeed in producing a cure, and therefore it is desirable to wait the event before any further operation be undertaken.

"Should this, however, prove insufficient, it will be necessary that the external shell of the bone be removed by means of a saw, and that the cartilage which it contains be dislodged by an elevator. If the integuments be carefully preserved, little deformity follows; and thus, by a simple operation, destruction, otherwise inevitable, is prevented."

Indeed, I confidently believe, that by the complete and judicious removal of all the local causes which first gave rise to the malady, and which have produced and kept up the formation and increase not only of morbid tumefactions, such as œdematous and sarcomatous swellings, but even of spongy exostoses, or osteo-sarcomatous diseases, and by the healthy action thereby excited, nature will not unfrequently effect their gradual removal either by absorption or sloughing; should it, however, not be equal to this task without assistance, it will at least produce such a concentration and demarkation of the secondary disease, as to afford a greater facility for the removal of any excrescence or tumour, by such other surgical means as the case may require.

Even if the whole of the inferior jaw be involved in osteo-sarcoma, I am convinced that, although it be gradual and slow, a more certain restoration will be effected by the plan above described, than by amputating the diseased jaw, independently of the greater danger and pain, and the loss of the important parts that cannot fail to be sustained under the latter operation.*

* Experience of the most fatal kind has abundantly shown, that the truly malignant forms of the diseases of the jaw-bones cannot be successfully extirpated

At all events, the temporary delay of such an operation in a chronic malady can be productive of no disadvantage, while a proper dental treatment must tend to improve the healthy action of the mouth, and thus insure a greater degree of success, should the amputation still be deemed necessary; besides, a premature or hasty performance of the operation will frequently lead to a treatment that may not only frustrate the cure, but unnecessarily endanger the health or life of the patient.

Indeed, the relief afforded to the affected parts by the removal of the teeth, although not actually suffering from caries, as well as the healthy stimulus thereby excited, is not sufficiently appreciated, and the manner in which it tends to promote the process of exfoliation and absorption is practically far more important than has hitherto been conceived; and I feel warranted by considerable observation and experience in asserting that in almost every case where a recovery can be reasonably expected, after a complete or partial amputation of the jaw, it will be more certainly and better obtained by the above treatment.

Under a conviction of its efficacy, I feel it my duty to urge that the formidable operation of amputating the jaw should not be undertaken until a fair trial of this milder system of treatment has

by amputation. Even when performed very early, and very completely, there is absolutely no advantage to be expected from excision; and it is never now attempted to make these cases the subjects of amputation. But in these, as in the milder forms of the disease, dental treatment is not only admissible, but affords the only means that hold out any prospect of cure, unless indeed the disease has proceeded to its latter stages, when owing to the displacement and destruction of parts, dental treatment can hardly be brought to bear, and in that case, if the affection be of a non-malignant character, excision may still be had recourse to. Thus the distinction made between the benign and malignant forms of these diseases, is one that does not at all influence the curative treatment, but is only of importance in distinguishing those cases that are suited to the *ultima ratio* of surgery from those that are not.

But every advanced case of disease has had its early stages, and if in these it was curable, its unarrested progress must be attributed to mismanagement. The patients who come under the hands of the operating surgeon have, with few exceptions, been previously under treatment by the general practitioner. It is he who is entrusted with the care of diseases in their most manageable stages; and who, therefore, has the greatest opportunities of applying curative measures. To the general practitioner, then, I would more particularly recommend the application of the principles of this essay.

first been made, and more especially, as no increased difficulty or danger need be apprehended from the temporary delay which would thus be occasioned. In conclusion, I beg to remark, that although it is my opinion that the important diseases in question admit generally of a more simple cure, I am far from wishing to detract from the great merits of those gentlemen who have recommended and undertaken the operation in question, which, although it was never performed by men of talent inferior to that possessed by Messrs. Dupuytren, Cloquet, Lallemand, Graeff, Mott, Mc.Lellan, Cusack, Crampton, Wardrop, and Hodgson, it must be confessed, is always to be regarded as one of the most precarious and appalling character.

The following highly complicated cases are particularly illustrative of the pathology and treatment of these diseases, and these, in conclusion, I beg to subjoin to this Essay.

CASE IV.

Mr. S——, of ———, a gentleman of about fifty-five years of age, of a very robust and plethoric constitution, and constant active habits of life, gave the following statement of his case.

His health had been generally good, but during the last six years he had sometimes suffered from swellings of the face, accompanied by an erysipelatous appearance, and heat of the skin, as well as obtuse pain, particularly situated in the nose, and its surrounding parts.

About eighteen months previously to his coming to town he discovered a small excrescence in his nose, followed by a considerable discharge of greenish fœtid matter. His surgical attendant removed the tumour with the forceps, assisted by the application of lunar caustic, but without effecting a permanent cure. The disease continued after a variety of surgical treatment, and its repeated extirpation was uniformly followed by returns of the excrescence. The general health of the patient becoming evidently affected, he was urgently advised by his physician and surgeon to visit London, in order to avail himself of the professional talents

of Mr. Lawrence. On an examination of the case, this gentleman instantly detected the actual disease, as well as the particular exciting cause. Viewing it as a case of osteo-sarcoma of the nose, and suspecting the state of the teeth to be the cause of the disease, he directed the patient to take my opinion with respect to the condition of his mouth.

By a careful inspection, I found the whole of the gums and sockets, more or less, suffering from that disease, of which I have more particularly treated in the second part of my "Dental Surgery," chap. iii., p. 270, under the title "Of the Devastation or Absorption of the Gums and Sockets of the Teeth." These parts were in a state of inflammation and suppuration, his teeth were much encrusted with green tartar, and many of them so far deprived of their gums and sockets, as to have become very loose, and their preservation was not only impossible, but their retention appeared to be a powerful exciting cause of the diseases of the mouth, notwithstanding they were entirely free from caries. The upper and under cuspid teeth were much out of their natural line, and from the permanent irregular action of one jaw upon the other, the lateral incisor, cuspidatus, and first bicuspis of the left side of the upper jaw had been deprived of their vitality, the fangs of which, by their irritation, had produced the disease.

The tumour adhered to the mucous membrane of the left nostril, and was about two-thirds of an inch in length, and a quarter of an inch in diameter; and I gave it as my opinion, that a permanent removal of the exostosis, and a complete cure of the disease could not be obtained without the extraction of every tooth, which, from the loss of its vitality, or deprivation of a considerable part of its sockets, and irregularity of its situation, acted as a permanent exciting cause of the disease; and the truth of this assertion will be particularly proved by the sequel of the case.

TREATMENT.

It was in the beginning of March, 1827, when the excrescence was removed by Mr. Lawrence, and soon after the operation, the

patient called on me, and stated that it was the request of that gentleman, that I would do every thing the case might require.

March 9th. Five teeth were extracted, and the patient directed to wash his gums with an astringent lotion eight or ten times a day.

March 13th. Two teeth were removed, and the use of the lotion requested to be continued.

March 16th. Four teeth were extracted, and the removal of three teeth more was particularly urged, but the patient would not submit to the operation.

March 21st. The teeth were scaled, and the use of a proper powder and brush directed.

March 27th. The scaling of the teeth was repeated, and minute directions given for preserving a perfect cleanliness of the mouth. I again very particularly explained the necessity for the removal of the three remaining injurious teeth, which were the lateral incisor and cuspidatus of the left side of the upper jaw, and cuspidatus of the right side of the lower jaw, but nothing would induce the patient to submit to the supposed disadvantageous loss of them. Having already so much recovered his general health from the former operations, and the local disease seeming to him also to be very rapidly improving, he hoped that the extraction of these three teeth might prove ultimately unnecessary, and he insisted at all events upon giving this a sufficient trial, before submitting to their removal.

After returning home to the country, the local disease continued to improve, but did not perfectly subside. Some inflammation remained, and a return of the tumour being apprehended, the patient again visited London, and on consulting Mr. Lawrence, that gentleman now positively insisted on the extraction of the three teeth I had pointed out as the cause of the irritation kept up in the affected parts.

May 10th. The three teeth in question were extracted.

May 15th. The teeth were again scaled and all the tartar perfectly removed.

After this complete removal of the local exciting causes the inflammation and pain in the nose almost immediately subsided,

and healthy inflammation and absorption of the diseased gums and sockets followed, as well as a complete cure of the local affection.

The patient was now rapidly restored to vigorous health, which he has ever since continued to enjoy.

CASE V.

Mr. D——, the son of a very respectable solicitor of ——, in Staffordshire, consulted me concerning a complicated disease of the upper and under jaws. As the malady had been of very long standing, I shall proceed first to give some account of its progress, and next of the state in which it was when it first came under my care.

According to the history I obtained from the father and the patient himself, the latter had always enjoyed good general health, and was considered a hearty child, but had very frequently suffered from his teeth. Both the first and second set had been very irregular, much affected by caries, and often painful. His face had been sometimes swollen in consequence of the diseased state of the gums and dental sockets. At the age of about eleven his teeth and gums became particularly troublesome, and at the same time also a polypus appeared in the left ear.

The polypus was extirpated, but the wounded part always remained sore, and some matter was continually discharged from a fistulous opening in the ear.

The best medical and surgical advice in this country had been obtained. In 1818, Sir Astley Cooper attended the patient, in consultation with Mr. Samuel Patrick. The opinion entertained at that time by this eminent surgeon on this uncommon and obscure case, is contained in the following note obtained from the patient himself, and which I beg leave to insert.

Master D——'s Case.

" Mr. Astley Cooper is of opinion that a tendency to scrofula in the constitution of Master D—— was the cause of the polypus which appeared in the ear twelve months ago, and which cause has also induced the disease in the parotid absorbent glands.

" He is fully persuaded that the complaint will ultimately do

well, though it will be tedious, and in all probability more exfoliation of bone will take place both in the ear and in the orbit, or rather perhaps in the malar bone." [This has taken place, and several portions of exfoliated bones are in my possession.] "His general health is the chief thing to be attended to, and twenty grains of bark with ten grains of soda, are to be given occasionally twice a day; a small dose of calomel and rhubarb is also to be given once in ten days or a fortnight, and the ear is to be syringed every day with warm water."

"SAMUEL PATRICK."

"Bartlett's Buildings, Aug. 17, 1817."

Subsequently to that period several other eminent physicians and surgeons had been consulted, and the disease was unanimously considered to be of a scrofulous nature and treated accordingly. Change of air, residence at the sea-side, travelling in the interior of England and France, and every means which medicine and parental affection could supply, were resorted to by the father with the hope of seeing his son once more restored to health.

No attention had been paid to the state of his teeth at any period of the disease, and some of his surgical attendants in the country had positively forbidden any recourse to the dental art, although nature had distinctly called for its assistance, by thrusting out some teeth and carious parts of the sockets of its own accord. No doubt this advice was founded on the principles that no benefit could be obtained from dental surgery, and that it was consequently much better to leave the local disease entirely to the sanative efforts of nature, than to frustrate these efforts by an improper treatment of the teeth. For my own part, however, I do not hesitate positively to assert, that by a judicious dental treatment a perfect cure could not have failed to be effected at that time, or at any subsequent period.

In April, 1845, when I first saw the patient, then about twenty years of age, a considerable sarcomatous swelling originating from the lower part of the inner plate of the ramus of the left side of the inferior jaw, extended downwards under the chin, and upwards over the left cheek, causing a distortion of the lips, nose,

eyes, and all the other features of the face towards the affected side. The matter was discharged externally through four fistulous openings, viz., one opposite the temporal bone, the second at the parotid gland, the third at the maxillary angle under the anterior part of the chin, and the fourth from the ear, a great portion of the external parts of which had been destroyed by the disease.

On viewing the disease within the mouth, it was found that the three molar, and the second bicuspid teeth of the left side had been previously lost, and the membranous and osseous cellular structure of the affected jaw had been destroyed to such an extent as to form a cavity, extending from the angle to the first bicuspis, and wide enough to allow the introduction and motion of the finger, which was filled with dark greenish matter. The first bicuspis and cuspidatus had lost a part of their sockets, and all the other teeth of the under jaw were either very irregular or carious, and the gums and sockets were either more or less diseased, or in a state of necrosis.

The upper jaw of the same side was also diseased, and the antrum filled with pus, the discharge of which was partially obstructed by some dead roots and teeth. All the incisors and molares of that jaw were also very irregular and lapping one over the other, and many of them were either diseased or dead, and their gums and sockets inflamed and suppurating.

The great accumulation of putrid matter and the various mortified and diseased structures, produced a very offensive and cadaverous smell.

TREATMENT.

The treatment I pursued, was the same which I have described in the foregoing essay.

April 12th. The cuspid and first bicuspid teeth of the under jaw on the left side were extracted, the sockets of which had suffered from the disease, and thus had been rendered causes of irritation. The patient then became exceedingly timid, and would not permit me to proceed, but promised to return the next morning with his father.

April 13th. Four dead and decayed teeth were removed, which

were all that required extraction, from the left side of the upper jaw, which was effected with inflammation and mortification; these operations were followed by a considerable discharge of fœtid matter from the antrum, through the sockets of the extracted teeth, and the disease was immediately relieved from all the direct local irritation. The great timidity of the patient would not suffer the removal of the other teeth that required to be extracted from the opposite side of the mouth on the same day, and it was therefore unavoidably delayed; he was directed to wash his mouth frequently with a warm emollient mixture and the external sores were to be dressed daily as usual.

April 19th. The patient was in excellent health and spirits. The diseased cavities of the left upper and under jaws were under the influence of healthy inflammation and granulation, the discharge from the ear, and from the opening opposite the temple had ceased, and the sore begun to heal, in consequence of the relief afforded by the convenient outlet of the matter from the upper maxillary cavity. The suppuration from the other external sores had also diminished in some degree, and the matter had become more concentrated in the swelling under the chin, which gradually increased in size.

Thus encouraged, the patient now very readily submitted to the necessary operations for the removal of seven dead roots, and decayed teeth from the right side of the upper and under jaw, by which every tooth which could cause irregular and morbid action of that side was also removed.

The frequent washing of the mouth was continued, and the diseased cavity of the under jaw directed to be frequently cleansed with a long soft brush, made for the purpose and dipped in the warm lotion.

April 23rd. The successful progress of the cure greatly elevated the spirits of the patient, who was now in very good health. The whole mouth was under the influence of healthy inflammation, the condition of the diseased *antra* continued to improve, and absorption in all the sockets and gums of the upper and under jaws was going on regularly. The external fistulous sores were all improving, and the purulent collection under the chin had

become more distinct. I proposed to open this abscess immediately, and let the matter escape in the most favourable direction under the chin, with a view thereby to allow the other external sores to heal as soon as possible, but I was again prevented by the timidity of my patient. Determined, however, to lose no time, I advised an immediate consultation with Mr. Lawrence, who entirely concurred with me in my opinion, and kindly undertook the operation. The discharge of matter was considerable, and the immediate relief, as well as the further favourable result of the treatment, was very evident, and highly gratifying to the patient. The abscess was dressed in the same manner as the other sores, and particular care taken to keep the puncture open.

April 26th. All the parts affected were doing remarkably well; the matter being now regularly discharged, none could collect in the diseased antrum, or in the under jaw, and granulation was therefore greatly facilitated; the upper diseased maxillary cavity, as well as the diseased gums and sockets, was rapidly recovering its healthy condition, and the external sores were daily improving.

April 29th, May 3rd, and 7th. The cure continued to progress most favourably, and the general health of the patient to improve.

May 10th. The whole mouth and the diseased parts were rapidly proceeding towards a perfect recovery; but the patient complained of a violent cold which he had contracted since his previous visit.

May 21st. I received a note from the father informing me that his son was very ill, and particularly desirous of seeing me at his residence in Westminster. I went immediately and found him confined to bed by a violent attack of erysipelas, a malady very prevalent at that time in Westminster. The patient was under the care of Mr. Pearse, the regular medical attendant of the family, and Dr. Jas. Johnson, who had been called in consultation; but although all the aid medical care and skill could afford was thus had recourse to, the malady proved fatal on the 26th of May.

POST MORTEM EXAMINATION.

On the 28th of May, Mr. Pearse and myself obtained permission from the parents to examine the mouth of the deceased.

The suppuration of the diseased cavity of the under jaw was found to have greatly decreased; the expansion of the osseous parts was much diminished, and granulation had taken place to a very considerable extent in the affected structures.

On the left side of the upper jaw, the healthy appearance of the gums showed that the progress of the disease of the antrum had been suspended, no trace of inflammation remaining.

The gums and sockets of the upper and under jaws on the right side were found in a perfectly healthy state, the alveoli nearly absorbed, and the parts whence the teeth had been extracted almost completely cicatrized.

A due consideration of the above facts cannot fail to show the propriety of the treatment which had been adopted; and there can be no doubt that the patient would have been rescued from the jaws of certain death, and cured of a distressing malady of ten or twelve years standing, had not the patient been cut off by the intervention of a general malady, which at that time, as already stated, was very prevalent in the neighbourhood, and, as Mr. Pearse informed me, proved fatal to many others, as well as to this patient, amongst the number of whom was the uncle of the deceased.

APPENDIX.

I REGRET that the Catalogue of Cases which is here appended, is neither so extensive nor so full as I could wish. It is evident that many of the eminent Surgeons whose names appear in these Tables, must have treated many cases of Disease of the Jaws, for every one that I have been able to give them credit for; while many others, whose names are not even mentioned, could very materially have added to my list. I trust, however, that of the published cases, but few have been allowed to escape notice.

I intentionally left the Glasgow cases to the last, in the hope that the vast resources of the Royal Infirmary Journals, in which annually upwards of 3000 cases, exclusive of contagious diseases and out-patients, are minutely recorded, might furnish many additional cases. But I have been disappointed. Owing to the most culpable irregularity on the part of some of the office-bearers of the institution, the Surgical Journals have, with the exception of some half-dozen volumes, disappeared, and thus a mass of very valuable medical records is lost to the profession and the public. When I was dresser in the Infirmary, under Dr. M. S. Buchanan, several highly interesting cases of jaw-disease occurred, in more than one of which amputation was deemed expedient, and was successfully performed, both by Dr. Buchanan and Dr. Macfarlane. It would have given me much pleasure to add these cases to my catalogue, but in the absence of any recorded history of them to refer to, I was prevented doing so, by the fear of committing some inaccuracy.

In none of the cases contained in these tables have I taken any notice of the results of the treatment. I commenced on the plan of stating the issue of each case, but I found it so impossible to get at any account of the ultimate result of many of them, and especially such as had been the subjects of the operation of excision, that, being unable to give satisfactory statements throughout on that head, I declined entering on it at all, and preferred resting the experimental proof of the correctness of the treatment recommended in this essay, to the results exhibited in the body of the work. (See Note, p. 46.) My chief object in collecting these cases, moreover, was to bring together as many as would furnish sound inferences as to the causes of the disease, and in this, I hope, I have not been unsuccessful.

The only arrangement that I have attempted, is the placing together of the different cases treated by the same surgeon, in whatever publication recorded, with the view of avoiding confusion. The numbers are added for the sake of reference.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
1	Haller, Disputat. Chirurg., vol. i., p. 214.	Dr. J. Runge.	Inflammation and suppuration.	Upper jaw.	Frequent and violent pain in teeth—hardly one sound tooth in mouth.	Perforation and injection.
2	Ditto, p. 216.	Ditto.	Tumour with cyst.	Lower jaw.	Frequent toothache—Molar teeth carious; fleshy cyst found at fangs, on extraction.	Extraction.
3	Ditto, ditto.	Ditto.	Inflammation and suppuration.	Ditto.	Frequent pain in teeth—Teeth, with exception of first molar, sound.	Extraction, perforation, and injection.
4	Ditto, p. 217.	Ditto.	Fleshy cyst.	——	Pain for several years—Canine tooth decayed to a stump.	Extraction.
5	Ditto, ditto.	Ditto.	Inflammation and suppuration.	Upper jaw.	Continued toothache—teeth sound, except first molar decayed to a stump.	Attempt at extraction, perforation, and injection.
6	Ditto, p. 218.	Ditto.	Sarcomatous tum.	Lower jaw.	Commenced in swelling under molar.	Excision of tumour.
7	Ditto, p. 219.	Ditto.	Tumour.	Ditto.	Limited to alveolus—Exostosis of roots of posterior molar with fungous fleshy growth—roots porous and friable.	——
8	Ditto, ditto.	Ditto.	Exostosis.	Upper jaw.	——	Excision of tumour.
9	Surgical Essays, by Sir A. Cooper and Mr. Travers, p. 186.	Sir A. Cooper.	Fungous tumour.	Lower jaw.	Commenced in loosening of teeth and fungus from alveolus.	——
10	Ditto, p. 191.	Ditto.	Fibro-cartil. tum.	Ditto.	Teeth carious.	——
11	Transactions of the Medical Society, 1799, v. ii. p. 309.	Dr. Baillie.	Fungous tumour.	——	One of the sockets empty.	——
12	Blandin's Anatomy of the Dental System, p. 108.	M. Blandin.	Carcinom. tumour.	Upper jaw.	Anormal growth of two molar teeth.	Incision and removal of irregular teeth.
13	Boyer's Maladies Chirurg.	M. Dubois.	Inflammation and suppuration.	Ditto.	Anormal position of canine tooth in antrum.	Removal of irregular Tooth.
14	Bell's Principles of Surgery, vol. iii. p. 227.	Mr. John Bell	Sarcomatous tum.	Lower jaw.	Commenced in gum between central incisors; involved the alveolus only.	Excision of tumour.
15	Ditto, p. 231.	Ditto.	Fungous tumour.	Ditto.	Commenced in separation of gum from tooth and alveolus; involved alveolus processes—Gums fungous, teeth loose, alveoli carious.	——

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
16	Bell's Principles of Surgery, vol. iii., p. 233.	Mr. John Bell	Fungous tumour.	Lower jaw.	Commenced in gradual swelling of gums.	Excision of tumour.
17	Bell's Cases of Surgery, vol. i., p. 416.	Sir C. Bell.	Sarcomatous tum.	Upper jaw.	Commenced in loosening of teeth; involved alveolar processes.	Teeth successively extracted, without benefit. Excision of alveoli.
18	Ditto, p. 419.	Ditto.	Ditto.	Ditto.	Commenced in loosening of teeth; involved alveolar processes.	Excision of alveoli.
19	Ditto, p. 421.	Ditto.	Ditto.	Ditto.	Commenced in swelling of gum; involved alveoli.	Ditto.
20	Ditto, p. 423.	Ditto.	Ditto.	Ditto.	Commenced in swelling of gum; involved alveolar processes.	Excision of tumour
21	Howship's Discrimination and Appearance of Surgical Disease, p. 4.	Mr. Howship.	Cancerous tumour.	Ditto.	Commenced in headache and pain of cheek.	—
22	Ditto, p. 5.	Ditto.	Malignant tumour.	Ditto.	Molar teeth on affected side gone, alveoli absorbed, gum protruded.	—
23	Ditto, ditto.	Ditto.	Sarcomatous tum.	Ditto.	One tooth wanting on affected side, besides the one extracted.	—
24	Ditto, ditto.	Ditto.	Cancerous tumour.	Ditto.	Tooth beneath tumour carious.	—
25	Howship's Practical Surgical Observations, p. 13.	Ditto.	Inflammation and suppuration, with necrosis.	Lower jaw.	Appeared after exposure to cold. Patient four years of age.	—
26	Ditto, p. 16.	Ditto.	Ditto.	Ditto.	Commenced in pain of face and headache, after application of cold water to face; teeth said to be sound; gums tender.	Teeth on affected side successively extracted, without benefit. Exfoliation.
27	Ditto, p. 19.	Ditto.	Ditto.	Ditto.	Carious tooth requiring extraction; supervened on injury of alveolus of extracted tooth in eating.	Exfoliation.
28	Ditto, p. 22.	Ditto.	Sarcomatous tum.	Upper jaw.	Appeared first in nostril.	—

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
29	Howship's Practical Surgical Observations, p. 26.	Mr. Howship.	Inflammation and suppuration, followed by tumour.	Upper jaw.	Commenced in swelling at angle of eyes.	——
30	Gensoul's Lettre Chirurgicale, p. 15.	M. Gensoul.	Fibro-cartilaginous tumour.	Ditto.	Injury followed by tumour in canine fossa.	Excision of jaw-bone.
31	Ditto, p. 28.	Ditto.	Fungous tumour.	Ditto.	——	Ditto.
32	Ditto, p. 34.	Ditto.	Osteo-sarcom. tum.	Ditto.	——	Ditto.
33	Ditto, p. 40.	Ditto.	Fibrous tumour.	Ditto.	Injury of part affected.	Ditto.
34	Ditto, p. 50.	Ditto.	Inflammation and suppuration.	Ditto.	Canine tooth wanting, found in course of operation, placed irregularly in antrum.	Removal of wall of antrum.
35	Ditto, p. 57.	Ditto.	Osteo-sarcom. tum.	Ditto.	Commenced in swelling over molar tooth. Examination of tumour, after operation, showed bone, softened and carious, over molar tooth and periosteum. Elsewhere healthy.	Excision of jaw-bone.
36	Ditto, p. 67.	Ditto.	Ditto.	Ditto.	Appeared after injury; gums of incisor teeth swollen and liable to bleeding.	Ditto.
37	O'Shaughnessey's Essay on Diseases of the Jaws, 1844.	Dr. O'Shaughnessey, of Calcutta.	Fibro-cartilag. tum.	Ditto.	Commenced in cheek, above second grinder. Patient says he never had a decayed tooth, nor one extracted.	Ditto.
38	Ditto.	Ditto.	Ditto.	Ditto.	Commenced in swelling of gum. Teeth sound at time of operation.	Ditto.
39	Ditto.	Ditto.	Ditto.	Ditto.	——	Ditto.
40	Ditto.	Ditto.	Spina ventosa.	Lower jaw.	Commenced in gumboil under second molar. Suppuration of alveoli.	Ditto.
41	Ditto.	Ditto.	Osteo-sarcom. tum.	Ditto.	Commenced in swelling of gum under first molar.	Ditto.
42	Bell's Anat. Phys. and Diseases of the Teeth, p. 265.	Mr. T. Bell.	Inflammation and suppuration.	Upper jaw.	Came on gradually, without pain. Tooth immediately under tumour carious.	Extraction of carious tooth, perforation of antrum, and injection.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
43	Bell's Anat. Phys. and Diseases of the Teeth, p. 270.	Mr. T. Bell.	Inflammation, suppuration, and necrosis.	Upper jaw.	Commenced after attack of fever, in loosening of molar, from absorption of socket. Teeth otherwise sound.	Natural cure.
44	Ditto, p. 272.	Ditto.	Inflammation and suppuration.	Ditto.	Commenced in pain and swelling of cheek, for which a tooth was extracted. Second bicuspid on affected side carious.	Extraction of carious tooth, perforation, and injection.
45	Ditto, p. 277.	Ditto.	Inflammation, suppuration, and necrosis.	Ditto.	Pain and enlargement of eye. Front tooth extracted. Gum exceedingly inflamed and tender where tooth had been extracted.	Perforation and injection, followed by exfoliation.
46	Ditto, p. 285.	Ditto.	Fungous tumour.	Ditto.	——	Excision of tumour and application of caustics
47	Ditto, p. 239.	Ditto.	Fibrous tumour.	Lower jaw.	Tumour made its appearance where tooth had been extracted. Three teeth wanting; part of alveolus necrosed.	Exfoliation.
48	Warren on Tumours, p. 111.	Prof. Warren, of Boston.	Bony exostosis.	Ditto.	Teeth above tumour sound.	——
49	Ditto, p. 112.	Ditto.	Ditto.	Ditto.	Wisdom tooth in the state of a stump.	Excision of jaw-bone.
50	Ditto, p. 128.	Ditto.	Spongy exostosis.	Upper jaw.	Commenced at root of canine tooth. Canine tooth involved was carious.	Excision of alveoli and tumour.
51	Ditto, p. 129.	Ditto.	Ditto.	Ditto.	Commenced in gum. Teeth gradually loosened.	Excision of alveoli.
52	Ditto, p. 130.	Ditto.	Ditto.	Ditto.	Painful tooth had been removed on affected side, previous to appearance of tumour.	Ditto.
53	Ditto, p. 132.	Ditto.	Exostosis.	Ditto.	Anormal position of tooth in maxillary sinus. Found on making incision.	Incision irregular. Tooth removed.
54	Ditto, p. 133.	Ditto.	Fleshy tumour.	Ditto.	Commenced after the filing of a carious tooth. Canine and lateral incisor teeth loose. Gums ulcerated.	Removal of loose Teeth and alveolus.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
55	Warren on Tumours, p. 144.	Prof. Warren, of Boston.	Osteo-sarcom. tum.	Lower jaw.	Commenced four months after receiving a blow on face.	Excision of jaw-bone.
56	Ditto, p. 480.	Ditto.	Fibrous tumour.	Upper jaw.	——	Partial removal of tumour.
57	Ditto, p. 482.	Ditto.	Fungous tumour.	Ditto.	——	Excision of tum.
58	American Journal of Dental Science, 1841-42, p. 251.	Ditto.	Encephal. Sarcoma.	Ditto.	First symptom—swelling of antrum.	Excision of jaw.
59	Koecker's Principles of Dental Surgery, page 368.	Mr. Koecker.	Inflammation and suppuration.	Ditto.	Replacing of tooth extracted by mistake.	Extraction of reinstated tooth, and other teeth injured by it.
60	Ditto, p. 24.	Ditto.	Inflammation and suppuration.	Ditto.	Caused by pivoting of canine tooth.	——
61	Ditto, p. 262.	Ditto.	Ditto, with necrosis.	Lower jaw.	Several stumps covered by the gums.	Extraction of stumps.
62	Ditto, p. 264.	Ditto.	Sarcomatous tum.	Upper jaw.	Retention of fang of second incisor.	Extraction of fang.
63	Ditto, p. 265.	Ditto.	Inflammation and suppuration.	Ditto.	Teeth sound, except first left upper molar decayed to a stump.	Extraction of stump.
64	Ditto, p. 266.	Ditto.	Carcinom. tumour.	Ditto.	Several stumps—ineffectual attempts at extraction had been made.	——
65	Ditto, p. 310.	Dr. Physick.	Inflammation and suppuration, with excrescences.	Ditto.	Injury in extracting tooth with key instrument.	Excision of excrescences of gum.
66	Ditto, p. 429.	Mr. Koecker.	Ditto.	Ditto.	Followed destruction of nerve of tooth. Teeth carious and covered with tartar.	——
67	Koecker's Essay on Diseases of the Jaws, p. 51.	Mr. Travers.	Carcinoma. tumour.	Ditto.	Patient subject to gum-boils—Mouth long unhealthy, many stumps, gums inflamed and swollen.	——
68	Ditto, p. 79.	Mr. Koecker.	Osteo-sarcom. tum.	Ditto.	Commenced in excrescence of nose—Teeth not carious, but affected with tartar—Gums and sockets absorbed—three teeth dead—Canine tooth irregularly placed.	Extraction of dead and irregular teeth, and removal of tartar.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
69	Koecker's Essay on Diseases of the Jaws, p. 63.	Mr. Koecker.	Inflammation, suppuration, and necrosis.	Both jaws.	Immediate cause, mercurial salivation; disease involved alveolar processes chiefly—Teeth sound, but several of them dead.	Extraction of dead teeth, and exfoliation.
70	Ditto, p. 84.	Ditto.	Inflammation and suppuration.	Both jaws.	Teeth irregular—many carious teeth—gums spongy.	Extraction.
71	Ditto, p. 26.	Ditto.	Ditto.	Upper jaw.	Carious teeth—stumps, and general unhealthy condition of mouth.	Extraction and removal of tartar.
72	Ditto, p. 26.	Ditto.	Ditto.	Lower jaw.	General diseased state of mouth—carious teeth and roots of teeth.	Ditto.
73	Medico-chirurgical Review, 1843, p. 75.	Ditto.	Fungous excrescences.	Both jaws.	Teeth sound but affected with tartar—sockets absorbed.	Extraction of affected teeth.
74	Quittenbaum, De Fungo Maxillæ.	Quittenbaum.	Fungous tumour.	Lower jaw.	Anormal growth and crowded state of Teeth.	——
75	Fox's Natural History and Diseases of the Teeth, vol ii., p. 75.	Mr. Fox.	Inflammation, suppuration, and necrosis.	Upper jaw.	Commenced in pain and swelling of the gum above incisor tooth; lateral incisor decayed.	Exfoliation of alveoli.
76	Ditto, p. 76.	Ditto.	Ditto.	Lower jaw.	Patient tormented with tooth-ache for a long period; first molar carious.	Ditto.
77	Ditto, p. 77.	Ditto.	Ditto.	Ditto.	Teeth carious.	Ditto.
78	Ditto, p. 84.	Ditto.	Fleshy tumour.	Upper jaw.	Patient had several teeth extracted when young; tumour commenced in thickening of the gums of extracted teeth.	Removal of tumour by ligature.
79	Ditto, p. 84.	Ditto.	Ditto.	Lower jaw.	Several decayed stumps, around which enlargements took place.	Extraction of stumps, and sloughing away of tumour.
80	Ditto, p. 87.	Ditto.	Ditto.	Upper jaw.	Excrescence closely surrounded molar teeth; teeth not decayed.	Two teeth extracted, and tumour removed by ligature.
81	Ditto, p. 89.	Sir A. Cooper.	Osteo-sarcom. tum.	Lower jaw.	Commenced as small tumour from gums of two molar teeth, both exceedingly carious, and subject to tooth-ache.	No treatment attempted.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
82	Fox's Natural History and Diseases of the Teeth, vol. ii., p. 130.	Mr. Fox.	Tumour.	Upper jaw.	First exhibited itself as a tumour above molar teeth; fangs of molars absorbed.	Scarifications.
83	American Journal of Dental Science, 1842-43, p. 37.	Dr. Harris, of Baltimore.	Inflammation.	Ditto.	Commenced in deep-seated pain, and discharge from nose; teeth carious.	Extraction of carious teeth.
84	Ditto, p. 38.	Ditto.	Ditto.	Ditto.	Pain between orbit and alveoli, and discharge from nose; teeth carious.	Ditto.
85	Ditto, p. 39.	Ditto.	Ditto.	Ditto.	Injury of alveolar processes from fall; teeth sound, but gums inflamed and ulcerated.	Ditto.
86	Ditto, p. 57.	Ditto.	Inflammation and suppuration.	Ditto.	Tartar on teeth; gums ulcerated; alveoli wasted; teeth loose.	Extraction of loose teeth.
87	Ditto, p. 58.	Ditto.	Ditto.	Ditto.	Tooth broken off to a stump; alveolar suppuration.	Extraction of stump.
88	Ditto, p. 63.	Ditto.	Ditto.	Ditto.	Exposure to cold; teeth, gums, and alveoli being diseased.	Extraction of dead teeth.
89	Ditto, p. 106.	Ditto.	Ditto.	Ditto.	Teeth carious.	Extraction of carious teeth.
90	Ditto, p. 117.	Ditto.	Ditto.	Ditto.	Teeth carious; alveolar abscess.	Perforation and injection, with ultimate extraction of carious teeth.
91	Ditto, p. 318.	Ditto.	Fungous tumour.	Ditto.	Molar tooth carious.	Extraction of carious tooth.
92	Desault's Cours Théorique et Pratique, vol. ii., p. 80.	M. Desault.	Fleshy tumour.	Ditto.	Tooth immediately under tumour carious; caries of alveoli.	Excision of tumour and application of cautery.
93	Ditto, p. 281.	Ditto.	Fungous tumour.	Lower jaw.	Commenced in gum under small molar, which was loose; whole alveolar border affected; fistula formed.	Ditto.
94	Archives Générales de la Médecine, 1835, p. 431.	Ditto.	Inflammation and necrosis.	Ditto.	Carious tooth.	Exfoliation.

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95	Archives Générales de la Médecine, 1835, p. 431.	M. Desault.	Inflammation and suppuration.	Lower jaw.	Exposure to cold; tooth carious.	Exfoliation.
96	Ditto, p. 432.	Ditto.	Ditto.	Ditto.	Syphilitic origin; teeth loose; continued exudation in the mouth.	Ditto.
97	Medico-Chirurg. Rev. vol. i., p. 213.	M. Lallemand	Fungous tumour.	Ditto.	——	Excision of jaw.
98	Gazette des Hôpitaux, 1834, vol. viii., p. 241.	M. Blandin.	Osteo-sarcom. tum.	Upper jaw.	Commenced with violent pain in molar tooth, which fell out, and socket immediately was occupied with fleshy tumour; alveolar border completely destroyed.	Ditto.
99	Lancet, 1833-4, vol. ii., p. 353.	Ditto.	Ditto.	Lower jaw.	Commenced in pain, and loosening of molar tooth.	Ditto.
100	Annales Médicales de Heidelberg, 1835.	Prof. Schwœrer.	Fungous tumour.	Ditto.	Supervened on violent tooth-ache; teeth at affected part carious; gums unhealthy; upper molars displaced.	Ditto.
101	Gazette des Hôpitaux, 1836, vol. x., p. 170.	M. Cloquet.	Inflammation, suppuration, and necrosis.	Ditto.	Patient had frequently had syphilis; commenced in pain and swelling of cheek.	Exfoliation.
102	American Journal of Dental Science, 1846, p. 324.	M. Depaul.	Ditto.	Ditto.	Two temporary molars carious; necrosed portion of bone contained a permanent tooth.	Removal of sequestrum of bone.
103	Ditto, ditto.	Ditto.	Inflammation and suppuration.	Ditto.	Anormal growth of wisdom tooth.	Extraction of irregular tooth.
104	Ditto, ditto.	M. Guersant.	Ditto.	Ditto.	Alveolar abscess of canine tooth.	Extraction of affected tooth.
105	Gazette des Hôpitaux, May 1835.	M. Marseille.	Carcinom. tumour.	Ditto.	Originated in cancer of lip.	Excision of jaw, at urgent request of patient.
106	Lancet, 1834-5, vol. i., p. 132.	M. Ricord.	Ditto.	Ditto.	——	Excision of jaw.
107	Medical Gazette, vol. xxxiii. p. 496.	Dr. B. Signoroni.	Osteo-sarcom. tum.	Ditto.	——	Ditto.

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108	Gazette des Hôpitaux, 1831, vol. v., p. 38.	Regnoli.	Osteo-sarcom. tum.	Upper jaw.	Blow on cheek, followed by constant pain and sensation of cold in incisor tooth, and soon after swelling of gum surrounding tooth.	Excision of jaw.
109	Medico-Chirurg. Review, 1826, p. 288.	Ditto.	Fungous tumour.	Both jaws.	Commenced in swelling behind last molar, followed by ulceration of gums; teeth carious from infancy.	Excision of alveolar processes and tumour.
110	Lancet, 1834-35, vol. i., p. 617.	M. Lisfranc.	Carcinom. tumour.	Lower jaw.	Commenced in headache and falling out of teeth, followed by excrescences from gum.	Excision of jaw.
111	Ditto, 1839-40, vol. i., p. 39.	Ditto.	Osseous tumour, with serous cysts.	Ditto.	Commenced in fungus from sockets of two extracted teeth.	Ditto.
112	American Journal of Medical Science, vol. iii., p. 219	Ditto.	Sarcomatous tum.	Ditto.	Gums ulcerated.	Ditto.
113	North American Medical and Surgical Journal, vol. ix., p. 194.	Dr. Samuel, of Conitz.	Inflammation, suppuration, and necrosis.	Upper jaw.	Patient, ætat. 13. Commenced in pain of jaw affecting teeth; alveoli chiefly involved.	Perforation of antrum, and injection.
114	Dublin Medical Journal, vol. i., p. 105.	M. Lafont, of Nantes.	Fibro-cartilag. tum.	Ditto.	Developed itself in alveolar border; two years previous to first appearance severe pain for twelve months in one of the teeth of affected side.	Excision of alveoli and tumour.
115	American Journal of Medical Science, vol. xxv., p. 458	Mr. Wænkner	Osteo-sarcom. tum.	Lower jaw.	———	Excision of jaw.
116	Lancet, 1834-35, vol. i., p. 261.	M. Robert.	Carcinom. tumour.	Upper jaw.	Teeth carious; tumour confined to antrum.	Ditto.
117	Archives Générales de la Médecine, 1835, p. 431.	M. Wanwy.	Inflammation and necrosis.	Lower jaw.	Commenced in salivary fistula. Teeth loose, gums swollen and painful.	Exfoliation.
118	Medical Times, vol. xvi., p. 334.	M. Willyk, of Töplitz.	Ditto.	Upper jaw.	Commenced in pain in cheek, followed by tumour near molar teeth, which on being extracted left an opening into antrum.	Injections.
119	Gazette des Hôpitaux, 1843, vol. v., p. 58.	M. Huguier.	Exostosis.	Ditto.	Patient, ætat. 16. Fall from chair, followed in six months by pain in molar teeth. Tumour first appeared in canine fossa.	Excision of jaw.

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120	Gazette des Hôpitaux, 1842, vol. iv., p. 302.	M. Berard.	Carcinom. tumour.	Lower jaw.	Commenced with dull pain in jaw.	Excision of jaw.
121	Mémoires de l'Academie Royale de Chirurgie, vol. xii.	M. Bordenave.	Inflammation and suppuration.	Upper jaw.	Teeth carious.	Extraction of carious teeth, perforation of antrum, and injection.
122	Ditto, Observ., iii., p. 10.	Ditto.	Ditto.	Ditto.	——	Perforation, and injection of antrum.
123	Ditto, Observ., v., p. 12.	Ditto.	Ditto.	Ditto.	Injury to socket in extracting carious tooth, tooth being driven into antrum.	Removal of carious tooth from antrum.
124	Ditto.	Ditto.	Inflammation, suppuration, and necrosis.	Ditto.	Teeth carious; gums and alveoli diseased.	Extraction of carious teeth, and exfoliation.
125	Ditto.	M. Planque.	Ditto.	Ditto.	Teeth carious; gums and sockets unhealthy.	Ditto.
126	Ditto.	M. Dubertrand.	Fibrous tumour.	Ditto.	Carious teeth; inflammation of alveoli.	Extraction of carious teeth, and excision of alveoli.
127	Ditto.	Acoluthus, of Pologne.	Cartilaginous tum.	Ditto.	Commenced in swelling of alveolus, after extraction of a diseased tooth.	Excision of alveoli and tumour; exfoliation.
128	Ditto.	M. Garengeot, of Rouen.	Fungous tumour.	Ditto.	Commenced in swelling of cheek and looseness of teeth.	Excision of tumour, and application of cautery.
129	Ditto.	M. Fauchard.	Inflammation and suppuration.	Ditto.	Bicuspid tooth on affected side carious.	Extraction of decayed bicuspid.
130	Ditto.	M. Beaupreau.	Ditto.	Ditto.	Appeared after extraction of wisdom tooth, alveolus being injured and fang of tooth retained.	Several teeth successively extracted, without advantage; exfoliation.

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131	Mémoires de l'Academie Royale de Chirurgie, Observ., v., p. 12.	M. Beaupreau.	Inflammation and suppuration.	Upper jaw.	Commenced in pain and swelling of alveoli; teeth carious.	Excision of alveoli, and perforation of antrum.
132	Ditto.	M. David.	Bony exostosis.	Ditto.	———	Excision of tumour.
133	Ditto.	M. Hevin.	Inflammation and suppuration.	Ditto.	First and second molar carious.	Extraction of carious teeth, and perforation of antrum.
134	Ditto.	M. Lamourier, of Montpellier.	Ditto.	Ditto.	Molar tooth carious.	Extraction of carious tooth, and perforation.
135	Lancet, 1829-30, vol. ii., p. 495.	M. Roux.	Sarcomat. tumour.	Lower jaw.	Tooth-ache and fungous growth from socket.	Excision of jaw.
136	Medico-Chirurgical Review, October, 1830.	Ditto.	Osteo-sarcom. tum.	Ditto.	Commenced in violent pain in teeth.	Ditto.
137	Dupuytren on Injuries and Diseases of the Bone, by Le Gros Clarke, p. 416.	Baron Dupuytren.	Ditto.	Ditto.	Appeared subsequent to a blow on part; alveoli particularly involved.	Ditto.
138	Ditto, p. 418.	Ditto.	Ditto.	Upper jaw.	Teeth loose, gums spongy; alveoli swollen.	No operation.
139	Ditto, p. 419.	Ditto.	Ditto.	Ditto.	———	Ditto. Several teeth had been extracted without giving relief.
140	Ditto, ditto.	Ditto.	Ditto.	Ditto.	Commenced in alveolar ridge; teeth carious. Carious tooth found imbedded in tumour.	Excision of jaw.
141	Ditto, p. 434.	Ditto.	Fibro-cartilag. tum.	Ditto.	Supervened after a blow.	Excision of tumour.
142	Ditto, p. 437.	Ditto.	Ditto.	Lower jaw.	———	———
143	Ditto, p. 438.	M. Loir.	Ditto.	Upper jaw.	Canine tooth in an anormal position.	———

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144	Dupuytren on Injuries and Diseases of the Bone, by Le Gros Clarke, p. 438.	Baron Dupuytren.	Fibro-cartilag. tum.	Lower jaw.	——	Excision of tumour.
145	Ditto, p. 439.	Ditto.	Ditto.	Ditto.	Injury in extracting carious tooth.	Ditto.
146	Ditto, p. 442.	Ditto.	Ditto.	Upper jaw.	Alveolar processes particularly involved.	Ditto.
147	Ditto, p. 443.	Ditto.	Ditto.	Lower jaw.	——	Ditto.
148	Ditto, p. 444.	Ditto.	Ditto.	Ditto.	——	Seton.
149	Ditto, p. 445.	Ditto.	Ditto.	Ditto.	——	Excision of tumour.
150	Ditto, p. 446.	Ditto.	Ditto.	Ditto.	——	Ditto.
151	Medical Gazette, 1828, p. 639.	Ditto.	Osteo-sarcom. tum.	Upper jaw.	Commenced in pain immediately above second molar tooth.	Second molar extracted without benefit; excision of jaw.
152	Ditto, 1829, p. 476.	Ditto.	Ditto.	Lower jaw.	Alveolar processes principally involved.	Excision of jaw.
153	Ditto, p. 540.	Ditto.	Necrosis.	Ditto.	Commenced in pain in jaw and death of teeth, accompanied by formation of fistula.	Removal of sequestrum.
154	Ditto, 1834, p. 27.	Ditto.	Osteo-sarcom. tum.	Ditto.	Commenced in dull pain in jaw, followed by prominence and looseness of canine tooth.	Excision of jaw.
155	Ditto, p. 29.	Ditto.	Fungus hæmatod.	Ditto.	Commenced in swelling of alveoli and looseness of teeth.	Ditto.
156	Gazette des Hôpitaux, 1831, vol. v., p. 249.	Ditto.	Inflammation, suppuration, and necrosis.	——	——	Removal of sequestrum.
157	Lancet, 1829-30, vol. i., p. 63.	Ditto.	Ditto.	Lower jaw.	——	Ditto.
158	Ditto, vol. ii., p. 62.	Ditto.	Carcinomat. tum.	Upper jaw.	——	Excision of tumour.
159	Ditto, 1833-34, vol. i., p. 56.	Ditto.	Ditto.	Lower jaw.	Commenced in looseness of bicuspid tooth, and fungous growth from alveolus.	Excision of jaw.
160	Ditto, p. 59.	Ditto.	Fungus hæmatod.	Ditto.	Originated at root of teeth.	Ditto.

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161	Lancet, 1837-38, vol. i., p. 698, case i.	Dr. Dieffenbach.	Osteo-sarcom. tum.	Upper jaw.	Involved alveoli of incisors.	Excision of alveoli, and actual cautery.
162	Ditto, case ii.	Ditto.	Ditto.	Ditto.	Involved alveoli of bicuspid, canine and incisor teeth.	Ditto.
163	Ditto, c. iii.	Ditto.	Ditto.	Ditto.	Occupied alveoli of canine and two incisor teeth.	Ditto.
164	Ditto, c. iv.	Ditto.	Sarcomat. tumour.	Ditto.	Involved two incisors and their alveoli.	Ditto.
165	Ditto, c. v.	Ditto.	Osteo-sarcom. tum.	Ditto.	Situated in alveolar processes, involved three teeth.	Ditto.
166	Ditto, c. vi.	Ditto.	Ditto.	Ditto.	One molar had been extracted; oozing of blood from gum on being touched.	Ditto.
167	Ditto, c. vii.	Ditto.	Steatom. tumour.	Ditto.	Embraced alveoli of front teeth.	Several teeth had been successively extracted without benefit; excision of alveoli, and cautery.
168	Ditto, c. viii.	Ditto.	Encysted tumour.	Ditto.	Commenced in thickening of front wall of antrum.	Excision of tumour.
169	Ditto, c. x.	Ditto.	Fibrous tumour, and hydatids.	Lower jaw.	——	Incisions, age preventing excision.
170	Ditto, c. xi.	Ditto.	Ditto.	Upper jaw.	——	Excision of tumour.
171	Ditto, c. xiii.	Ditto.	Ditto.	Lower jaw.	Preceded by falling out of teeth. Tumour caused separation of the two plates of the bone.	Ditto.
172	Ditto, c. xiv.	Ditto.	Osteo-sarcom. tum.	Upper jaw.	Involved alveoli of molar teeth.	Repeated excision of alveoli.
173	Ditto, c. xv.	Ditto.	Fungous tumour.	Ditto.	——	Excision of jaw.
174	Ditto, c. xvi.	Ditto.	Ditto.	Ditto.	First noticed on nose.	Excision of tumour.

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175	Lancet, 1837-38, vol. i., case xvii.	Dr. Dieffenbach.	Fibrous tumour.	Upper jaw.	———	Excision of tumour.
176	Ditto, c. viii.	Ditto.	Steatomat. tumour.	Ditto.	———	Excision of jaw.
177	Ditto, p. 534.	Dr. Dietz, of Berlin.	Osteo-sarcom. tum.	Ditto.	Appeared subsequent to injury of part.	Ditto.
178	Ditto, 1829-30, vol. i., p. 641.	Prof. Seutin, of Brussels.	Necrosis.	Ditto.	Teeth loose, gums ulcerated.	Removal of sequestrum.
179	Ditto, 1828-29, vol. ii., p. 741.	Prof. Vacca, of Pavia.	Fungous tumour.	Ditto.	———	Excision of tumour.
180	Ditto, p. 511.	M. Velpeau.	Sarcomat. tum. and necrosis.	Ditto.	Decayed teeth; tumour of gums.	Ditto.
181	Gazette des Hôpitaux, 1829, No. vi., p. 21.	Ditto.	Tumour.	Ditto.	Commenced in swelling of gum and discharge from socket after extraction of a molar tooth.	Excision of jaw.
182	Ditto, 1843, vol. v., p. 18.	Ditto.	Fibrous tumour.	Lower jaw.	"Probable root of tumour at bottom of alveolus."	Excision of alveoli.
183	Ditto.	Ditto.	Tumour and necrosis.	Ditto.	Commenced in swelling and pain of jaw.—"Patient *says* he has no decayed teeth."	Ditto.
184	American Journal of Dental Science, 1846, p. 192.	Mr. Dillingham.	Inflammation and suppuration.	Upper jaw.	———	Five teeth successively extracted without benefit. Perforation of antrum.
185	Ditto, 1843, p. 53.	Mr. Shepherd, of Petersburg, U. S.	Fibrous tumour.	Lower jaw.	Carious molar affecting socket.	Excision of tumour.
186	Ditto, 1842-43, p. 138.	Dr. Gibson, of Baltimore.	Osteo-sarcom. tum.	Ditto.	Appeared in consequence of blow on chin.	Excision of jaw.
187	Ditto, p. 142.	Dr. Mussey.	Encephal. sarcoma.	Upper jaw.	Commenced in swelling and pain in alveolar ridge.	Several teeth extracted without benefit; excision of jaw.

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188	American Journal of Dental Science, 1842-3, p. 180.	Mr. Rodrigues, of Charleston.	Bony exostosis.	Upper jaw.	——	Several teeth extracted with no benefit; excision of tumour.
189	Ditto, p. 129.	Prof. Bond, of Baltimore.	Inflammation and suppuration, with necrosis.	Ditto.	Carious teeth and alveolar abscess.	Extraction of carious teeth, and removal of sequestrum.
190	Ditto, p. 99.	Dr. Roper, of Philadelphia.	Inflammation and suppuration.	Ditto.	First molar tooth carious.	Extraction.
191	Ditto, 1846, p. 291.	Mr. Harrington, of Philadelphia.	Fungous tumour.	Lower jaw.	Commenced in pain of teeth and jaw; fungus of gum after extraction of three teeth.	Incisions and escharotics.
192	American Journal of Medical Sciences, vol. vii., p. 331.	Dr. J. R. Barton.	Sarcomat. tumour.	Ditto.	Commenced in swelling of gum from injury in extracting a tooth.	Excision of jaw.
193	Ditto, vol. x., p. 315.	Mr. Anderson, of Stateburg, U. S.	Osteo-sarcom. tum.	Ditto.	Consequent on injury of part.	Ditto.
194	Ditto, vol. xxiii., p. 261.	Mr. Eve, of Augusta, U.S.	Tumour.	Ditto.	——	Ditto.
195	Ditto, vol. xxiv., p. 260.	Dr. Wort, of Jackson, U.S.	Osteo-sarcom. tum.	Ditto.	Consequent on external injury.	Ditto.
196	Medical Gazette, 1829-30, p. 717.	Dr. Randolph, of Philadelphia.	Ditto.	Ditto.	Commenced in swelling of alveolus after extraction of a tooth.	Ditto.
197	Medical Times, vol. xvi., p., 455.	Mr. Sims, of Montgomery, U. S.	Carcinomat. tum.	Upper jaw.	Began as excrescence of gum. Gums purple, tumid, bleeding; teeth decayed, fangs exposed.	Ditto.
198	Medico-Chirurgical Review, 1823.	Dr. M'Lellan, of Boston.	Osteo-sarcom. tum.	Lower jaw.	Partial luxation of teeth from a fall; teeth immediately afterwards appearing discoloured and slightly loose.	Ditto.

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199	Medico-Chirurgical Review, vol. v., p. 533.	Dr. M'Lellan, of Boston.	Necrosis.	Lower jaw.	Earliest symptom, ulceration of gums and cheek. Patient had just completed first dentition.	Removal of sequestrum.
200	Ditto, p. 534.	Ditto.	Fibro-cartilag. tum.	Ditto.	First appeared at under lip.	Excision of jaw.
201	Medical Gazette, 1833, p. 494.	Mr. Scott, London Hospital.	Osteo-sarcom. tum.	Upper jaw.	Decayed tooth on affected side.	Extraction of decayed tooth without benefit. Excision of jaw.
202	Lancet, 1831-2, vol. i., p. 604.	Ditto.	Tumour.	Ditto.	——	Ditto.
203	Ditto, p. 319.	Ditto.	Osteo-sarcom. tum.	Ditto.	Consequent on injury from a blow.	Ditto.
204	Ditto, 1827-8, vol. i., p. 63.	Mr. Earle.	Fungous tumour.	Ditto.	Preceded by catarrh.	No operation.
205	Ditto, 1835-6, vol. i., p. 221	Ditto.	Medullary sarcoma.	Lower jaw.	——	Excision of jaw.
206	Ditto, vol. xi., p. 747.	Ditto.	Osteo-sarcom. tum.	Ditto.	Commenced in swelling of alveoli, after extraction of a tooth; afterwards patient received a blow on face.	Exfoliation.
207	Ditto, 1842, vol. ii., p. 889.	Mr. Fergusson.	Ditto.	Upper jaw.	——	Excision of jaw.
208	Ditto, 1842-3, vol. i., p. 856	Ditto.	Necrosis.	Lower jaw.	Patient twice received blows on the face. Had a tooth extracted, after which fistulous opening formed in gum.	Removal of sequestrum.
209	Transactions of the Medical and Chirurgical Society, vol. viii., p. 224.	Mr. Blagden.	Inflammation and suppuration.	Upper jaw.	Tooth under antrum carious; patient had had several carious teeth.	Extraction of carious tooth, followed by fatal hæmorrhage.
210	Lancet, 1827, p. 27.	Mr. Wardrop.	Tumour.	Lower jaw.	Commenced in gum-boil after a bruise.	Excision of jaw.
211	Ditto, 1833-4, vol. ii., p. 830	Ditto.	Fibrous tumour.	Ditto.	Commenced in alveoli.	Excision of tumour, and application of potassa fusa.
212	Ditto, ditto.	Ditto.	Ditto.	Upper jaw.	——	Excision of tumour and application of potassa fusa.

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213	Lancet, 1833-34, v. ii., p. 576.	Mr. Key.	Malignant tumour.	Upper jaw.	Commenced in alveoli.	Excision of jaw.
214	Ditto, 1828, vol. ii., p. 831.	Ditto.	Scirrhous tumour.	Lower jaw.	Tooth-ache and swelling of cheek.	Excision of tumour.
215	Guy's Hospital Reports, first series, vol. i., p. 403.	Mr. Morgan.	Bony exostosis.	Upper jaw.	——	Excision of jaw.
216	Medical Gazette, 1829-30, p. 286.	Ditto.	Fungous tumour.	Lower jaw.	Molar teeth carious; alveolar abscess.	Ditto.
217	Lancet, 1833-4, vol. ii., p. 285.	Ditto.	Ditto.	Ditto.	——	Ditto.
218	Ditto, p. 368.	Mr. S. Cooper	Tumour.	Ditto.	——	Ditto.
219	Provincial Medical Journal, vol. iii., p. 258.	Mr. Walker.	Ditto.	Ditto.	Alveoli alone implicated; a tooth in the neighbourhood of the tumour decayed rapidly with the increase of the disease.	Excision of alveoli.
220	Lancet, 1839-40, vol. i., p. 485.	Ditto.	Osteo-sarcom. tum.	Ditto.	Jaw full of carious teeth.	Excision of jaw, and extraction of some of remaining carious teeth.
221	Ditto, 1834-5, vol. ii., p. 398.	Ditto.	Ditto.	Ditto.	Commenced in pain of gums and sockets; many carious teeth.	Excision of jaw.
222	Medical Gazette, 1835, p. 347.	Sir Benjamin C. Brodie.	Inflammation.	Upper jaw.	——	Exhibition of mercury.
223	Ditto, ditto.	Ditto.	Inflammation and suppuration.	Ditto.	Tooth under antrum carious.	Extraction of carious tooth; perforation and injection of antrum.
224	Ditto, p. 349.	Ditto.	Ditto.	Ditto.	——	Perforation and injection of antrum.
225	Lancet, 1831-2, vol. ii., p. 350.	Ditto.	Inflammation, suppuration, and necrosis.	Lower jaw.	Originated in loosening of second molar, from affection of fang.	——

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226	Medical Gazette, 1835.	Sir Benjamin C. Brodie.	Inflammation, suppuration, and necrosis.	Upper jaw.	Consequent on injury from fall.	Perforation of antrum and removal of sequestrum.
227	Lancet, 1844, vol. ii., p. 90.	Mr. H. J. Johnson.	Tumour.	Lower jaw.	Consequent on blow.	Exhibition of iodine.
228	Guy's Hospital Reports, second series, vol. i.	Mr. W. Williams.	Fungous Tumour.	Upper jaw.	Tooth carious.	Excision of jaw.
229	Lancet, 1836-7, vol. i., p. 511.	Mr. Babington.	Necrosis.	Lower jaw.	———	Removal of sequestrum.
230	London Medical and Surgical Journal, Oct. 1835.	Mr. Guthrie.	Medullary sarcoma.	Upper jaw.	Commenced in swelling of gum over alveolar processes. Alveoli principally involved, and on examination after operation found absorbed.	Excision of jaw.
231	Lancet, 1835-6, vol. i., p. 152	Mr. Stanley.	Osteo-sarcom. tum.	Lower jaw.	———	Ditto.
232	Medical Gazette, 1830, p. 766.	Mr. Green.	Ditto.	Ditto.	Commenced in dropping out of tooth from alveolar abscess.	Ditto.
233	Lancet, 1843-4, vol. i., p. 484.	Mr. Gay.	Medullary sarcoma.	Ditto.	First bicuspid carious; fang broken off in extraction.	Fang removed without benefit; excision of jaw.
234	Medical Gazette, 1837, p. 1021.	Mr. C. Hawkins.	Fibrous tumour.	Upper jaw.	Commenced in swelling over first molar; patient subject to tooth-ache; stump on affected side; another stump exposed during operation at root of tumour.	Excision of alveoli.
235	Ditto, 1838-9, p. 473.	Ditto.	Cystic tumour.	Ditto.	Patient beginning second dentition.	Extraction of three teeth.
236	Ditto, 1846.	Mr. J. W. Hawkins.	Fibrous tumour.	Ditto.	Carious teeth, causing alveolar abscess.	Excision of alveoli.
237	Ditto, vol. xxxvii., p. 89.	Mr. Solly.	Osteo-fibrous tum.	Ditto.	Occurred after tooth-ache; only one carious molar remaining on affected side; gum over one of the empty sockets ulcerated. Examination of tumour after operation, showed that the disease originated from alveoli of first [small?] molar and incisor.	Excision of jaw.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
238	Medical Gazette, vol. xxxvii., p. 94.	Mr. Solly.	Inflammation, suppuration, and necrosis.	Upper jaw.	Gums spongy and deep red.	——
239	Ditto, 1838, p. 153.	Mr. Lawrence	Fibrous tumour.	Ditto.	Commenced in alveolar ridge. Patient had long suffered from tooth-ache and gum-boils; several stumps remaining in jaw.	Excision of tumour.
240	Ditto, p. 154.	Ditto.	Fibro-cartil. tumour.	Ditto.	Originated from decayed tooth; several teeth imbedded in tumour.	Ditto.
241	Ditto, p. 155.	Ditto.	Cystic tumour.	Lower jaw.	Gum over tumour contained fangs of a decayed molar.	Ditto.
242	Ditto.	Ditto.	Ditto.	Upper jaw.	Gum under tumour contained stump.	Ditto.
243	Ditto.	Ditto.	Ditto.	Ditto.	Several stumps removed from jaw shortly before tumour was noticed.	Ditto.
244	Ditto.	Ditto.	Ditto.	Ditto.	Patient ætat. 15.	Ditto.
245	Ditto, 1833, p. 590.	Ditto.	Osteo-sarcom. tum.	Lower jaw.	Commenced in swelling of alveoli, ending in abscess and fistula.	Excision of jaw.
246	Lancet, 1831-2, vol. ii., p. 30.	Ditto.	Bony exostosis.	Upper jaw.	Commenced in alveoli; teeth carious.	Ditto.
247	Ditto, 1834-5, vol. i., p. 187.	Ditto.	Osteo-sarcomat. tum.	Lower jaw.	Commenced in swelling of gums and alveoli.	Ditto.
248	Provincial Medical and Surgical Journal, 1846.	Mr. Greenhow, of Newcastle.	Medullary sarcoma.	Ditto.	Consequent on blow.	Excision of tumour.
249	Ditto, vol. iii., p. 514.	Mr. Teale, of Leeds.	Fibrous tumour.	Upper jaw.	Commenced in pain of teeth and gums, with swelling; "teeth appeared sound;" tumour principally implicated external surface of alveoli.	Excision of jaw.
250	Ditto, vol. v., p. 452.	Ditto.	Cystic tumour.	Ditto.	Commenced in swelling of palate, consequent on injury; tumour attached to periosteum of palate.	Ditto.
251	Ditto, vol. ii., p. 421.	Mr. Lingen, of Hereford.	Fibrous tumour.	Ditto.	Originated apparently about the roots of two lateral incisors.	Ditto.
252	Ditto, vol. v., p. 245.	Mr. Lucas.	Inflammation, suppuration, and necrosis.	Lower jaw.	Commenced in swelling of jaw.	Tooth extracted without benefit; exfoliation.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
253	Provincial Medical and Surgical Jour., vol. vii., p. 129.	Mr. Smith, of Leeds.	Tumour.	Upper jaw.	First observed on ala of nose and palate; alveolar processes chiefly involved.	Excision of jaw.
254	Ditto, p. 130.	Ditto.	Ditto.	Ditto.	Tumour first noticed in temporal fossa, and subsequently in palate.	Ditto.
255	Dublin Medical Journal, 1842, vol. xxi., p. 390.	Dr. Byron. Co. Meath.	Osteo-sarcom. tum.	Lower jaw.	Made its appearance after extraction of last molar tooth; growth involved alveoli principally.	——
256	Lancet, 1844, vol. i., p. 412.	Dr. Smethurst.	Inflammation and suppuration.	Upper jaw.	Consequent on excision of crown of carious incisor, and insertion of artificial tooth by pivoting.	Extraction of root of excised tooth.
257	Liston's Elements of Surgery, p. 419.	Mr. Liston.	Osteo-sarcom. tum.	Lower jaw.	First appeared as a swelling over two last molars, which were not cut.	Excision of tumour with no effect; excision of jaw.
258	Ditto, p. 421.	Ditto.	Spina ventosa.	Ditto.	Teeth carious.	Incision and removal of part of bone.
259	Ditto, Operative Surgery, p. 304.	Ditto.	Fungous tumour.	Upper jaw.	Teeth very much crowded in front. Commenced in swelling of cheek and fungus from socket of an extracted molar.	Molar extracted to make room, tumour excised afterwards.
260	Ditto, fourth edition, p. 300.	Ditto.	Fleshy tumour.	——	Commenced in gum between first and second molars. Tumour found adherent to peridental membrane.	Extraction of teeth involved.
261	Ditto, in Trans. Medical and Chirurgical Society, vol. xx., p. 189.	Ditto.	Fibro-cart. tumour.	Upper jaw.	Commenced in pain of teeth and swelling on outside of gum.	Extraction of several teeth ineffectual; excision of jaw.
262	Ditto, p. 180.	Ditto.	Osteo-sarcom. tum.	Ditto.	Caries of molar tooth, followed by swelling of cheek.	Excision of jaw.
263	Ditto, p. 184.	Ditto.	Fibro-cartilag. tum.	Ditto.	Injury of cheek, followed by dropping out of molar tooth and projection of fleshy tumour from surrounding gum.	Successive extraction of teeth, with no advantage; excision of jaw.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
264	Transactions of the Medical and Chirurgical Society, vol. xx., p. 186.	Mr. Liston.	Fibro-cartilag. tum.	Upper jaw.	Blow received on cheek.	Excision of jaw.
265	Lancet, 1835-36, vol. i., p. 887.	Ditto.	Osteo-sarcomat.tum.	Lower jaw.	Temporary teeth carious; alveolar abscess.	Ditto.
266	Ditto, 1836-37, vol. i., p. 237.	Ditto.	Fibro-cartilag. tum.	Upper jaw.	Sprung originally from the gums and sockets of the incisors and canine teeth; teeth not carious.	Ditto.
267	Ditto, p. 346.	Ditto.	Sarcomatous tum.	Ditto.	Blow on cheek; loosening of molars and swelling of gum.	Ditto.
268	Ditto, vol. ii., p. 173.	Ditto.	Ditto.	Ditto.	Many carious teeth; one extracted; tumour from empty socket.	Excision of jaw, and extraction of remaining carious teeth.
269	Ditto, 1839-40, vol. i., p. 768.	Ditto.	Necrosis and fist.	Lower jaw.	Carious teeth and alveolar abscess.	Removal of sequestrum.
270	Ditto, p. 39.	Ditto.	Sarcomat. tumour.	Ditto.	Nearly all the teeth lost from caries connected with alveolar abscess.	Excision of jaw.
271	Ditto, p. 245.	Ditto.	Fibrous tumour.	Ditto.	All the teeth gone on affected side except one stump; frequent gum-boils.	Ditto.
272	Ditto, vol. ii., p. 104.	Ditto.	Sarcomat. tumour.	Ditto.	Many carious teeth; commenced in swelling of gum under second molar.	No operation, skin being involved.
273	Ditto, p. 60.	Ditto.	Suppuration and necrosis.	Upper jaw.	Injury and fracture of jaw.	Removal of sequestrum, and perforation of antrum.
274	Ditto, p. 103.	Ditto.	Sarcomat. tum.	Lower jaw.	Alveolar abscess with fistula. A tooth extracted; fungus from socket.	Excision of jaw.
275	Ditto, p. 104.	Ditto.	Malig. tumour.	Ditto.	Preceded by cancerous affection of lip.	No operation, glands being involved.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
276	Lancet, 1839-40, vol. ii., p. 717.	Mr. Liston.	Fibrous tumour.	Lower jaw.	Teeth at affected part carious; alveolar abscess.	Excision of tumour and alveoli.
277	Ditto.	Ditto.	Ditto.	Ditto.	Teeth crowded, affected with caries; alveolar abscess.	Ditto.
278	Ditto, 1840-41, vol. i., p. 390.	Ditto.	Carcinomat. tum.	Ditto.	Teeth *tolerably* sound; appeared first in glands.	No operation.
279	Ditto, p. 416.	Ditto.	Fibro-cartilag. tum.	Ditto.	Carious Teeth. Alveolar abscess; gums spongy; wisdom tooth irregular.	Excision of jaw.
280	Edinburgh Medical and Surgical Journal, July, 1828.	Ditto.	Osteo-sarcom. tum.	Ditto.	Teeth carious. Had always suffered from tooth-ache and gum-boils.	Ditto.
281	Ditto, vol. xvii., p. 397.	Ditto.	Fungous tumour.	Upper jaw.	Attended at first with violent head-ache. Gums tender, pain on pressing teeth.	Excision of tumour and cautery; relapse.
282	Lancet, 1841-42, vol. i., p. 67.	Ditto.	Tumour.	Ditto.	First appeared in left nostril, and afterwards in alveoli.	Excision of jaw.
283	Lancet, 1831-32, vol. ii., p. 336.	Mr. Bryan, Stowmarket.	Osteo-sarcoma. tum.	Ditto.	Patient, ætat. 8. Carious tooth connected with affection of the periosteum.	Excision of tumour.
284	Ditto, 1834-35, vol. i., p. 348.	Mr. Allport, of Lichfield.	Ditto.	Lower jaw.	First symptom, swelling of gum like cutting of wisdom tooth.	Excision of jaw.
285	Ditto, 1827, p. 620.	Sir George Ballingall.	Sarcomat. tumour.	Upper jaw.	Commenced with tooth-ache in grinders after exposure to cold; one of them had been extracted.	Excision of tumour.
286	Ditto, 1839-40, vol. i., p. 359.	Mr. Quinton, of Wolverhampton.	Tumour.	Ditto.	First symptom, swelling of gum.	Excision of jaw.
287	Ditto, 1843-44, vol. i., p. 149.	Mr. Raleigh, E. I. C. S.	Ditto.	Ditto.	———	Ditto.
288	Ditto, 1838-39, vol. ii., p. 217.	Mr. White, of Nottingham.	Ditto.	Ditto.	First observed as swelling in canine fossa; patient attributes disease to influenza.	Ditto.
289	Ditto, 1829-30, vol. i., p. 308.	Mr. Robinson, of Haverhill.	Osteo-cartilag. tum.	Ditto.	Toothache consequent on injury.	Ditto.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
290	Transactions of the Medical and Chirurgical Society, vol. xxi., p. 290.	Mr. Perry, of Marylebone Infirmary.	Inflammation, suppuration, and necrosis.	Lower jaw.	Commenced during second dentition in pain and swelling affecting teeth and jaw. Anormal growth of second set of teeth discovered after operation.	Removal of sequestrum of bone.
291	Edinburgh Medical and Surgical Journal, vol. xv., p. 523.	Mr. Hill, of Chester.	Osteo-sarcom. tum.	Upper jaw.	Tooth-ache requiring extraction; gums flabby; teeth loose, but "appeared" sound.	Excision of tumour.
292	Ditto.	Mr. Nivison, of Barbadoes.	Ditto.	Ditto.	Carious tooth; injury caused by extraction.	Excision of jaw.
293	Transactions of the Medical and Physical Society of Calcutta, vol. v., p. 285.	Mr. Brett, of H. E. I. C. S.	Fibrous tumour.	Lower jaw.	Appeared to commence in irritation at chin; disease seated principally in alveoli.	Ditto.
294	Dublin Hospital Reports, vol. iv.	Dr. Cusack.	Sarcom. tumour.	Ditto.	Carious teeth and injury.	Ditto.
295	Ditto.	Ditto.	Ditto.	Ditto.	First symptom, swelling of gum between first and second molars.	Ditto.
296	Ditto.	Ditto.	Ditto.	Ditto.	First symptom, swelling of gum between two last molar teeth.	Ditto.
297	Ditto.	Ditto.	Ditto.	Ditto.	First symptom, acute pain in last molar.	Ditto.
298	Ditto.	Ditto.	Ditto.	Ditto.	First symptom, severe pain in last molar.	Ditto.
299	Ditto.	Ditto.	Ditto.	Ditto.	Earliest symptom, acute pain in two last molar teeth; afterwards received a blow on affected side.	Ditto.
300	Ditto.	Ditto.	Ditto.	Ditto.	First symptom, acute pain in first molar.	Ditto.
301	Ditto.	Sir Philip Crampton.	Osteo-sarcom. tum.	Ditto.	First symptom, swelling of gum between small grinders.	Ditto.
302	Ditto.	Ditto.	Ditto.	Ditto.	Teeth firm and not carious.	Ditto.
303	Ditto.	Ditto.	Malig. tumour.	Ditto.	———	No operation.
304	Provincial Medical and Surgical Journal, 1845, vol. viii., p. 750.	Mr. Burdett, of Birmingham.	Fibrous tumour.	Upper jaw.	Referred to carious teeth on affected side.	Two carious teeth extracted without benefit. Excision of jaw.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
305	Provincial Medical and Surgical Journal, 1844, p. 290.	Sir J. Fyfe.	Osteo-sarcom. tum.	Upper jaw.	First symptoms, small tumours at inner canthus of eye, and numbness of one or two molar teeth.	Excision of tumour.
306	Medical Gazette, 1839-40, vol. xvi., p. 257.	Mr. Ferrall, of Dublin.	Fungous tumour.	Ditto.	First symptom, pain like tooth-ache.	——
307	Medical Times, vol. xvi., p. 322.	Mr. Morris, of Spalding.	Sarcom. tumour.	Ditto.	First symptoms, pain in cheek and looseness of second molar, which appeared sound.	Excision of alveoli.
308	Transactions of the Medical and Chirurgical Society, 1844, vol. xxvii., p. 432.	Mr. Sharpe, of Bradford.	Necrosis.	Lower jaw.	Commenced in tooth-ache; second bicuspid carious, and fungous growth at fang.	Exfoliation.
309	Medical Gazette, 1833, p. 159.	Mr. Adams.	Fibro-cartil. tumour.	Ditto.	Patient had been salivated; commenced after extraction of a tooth affected with tooth-ache.	Excision of jaw.
310	Transactions of the Provincial Medical and Surgical Association, vol. i., p.279.	Mr. Hetling, of Bristol.	Osteo-sarcom. tum.	Both jaws.	Consequent on chill from cold; teeth loose, but sound; discharge from gums; patient never had gum-boils or carious teeth.	Ditto.
311	Medical Gazette, vol. xxxv., p. 46.	Dr. Chisholm, of Inverness.	Spina ventosa.	Lower jaw.	——	Ditto.
312	Ditto, 1833, p. 10.	Mr. Davidson, of Little Bacolet.	Tumour.	Ditto.	Connected with an opening behind canine tooth.	Ditto.
313	Lancet, 1827-8, vol. i., p. 157.	Mr. Hodgson, of Birmingham.	Osteo-sarcom. tum.	Ditto.	First appeared as a fungous growth from socket of a bicuspid tooth, which was extracted.	Ditto.
314	Provincial Medical and Surgical Journal, vol. viii., p. 183.	Ditto.	Malignant tumour.	Ditto.	Commenced in excrescence of gum.	Three teeth extracted without benefit. Excision of jaw.
315	Ditto.	Ditto.	Fibrous tumour.	Ditto.	——	Excision of jaw.
316	Lancet, 1839-40, vol. i., p. 40.	Dr. Bull, of Cork.	Fibro-cartil. tumour.	Ditto.	Molar teeth imbedded in tumour.	Ditto.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
317	Lancet, 1845, vol. ii., p. 44.	Mr. Vanderpant.	Tumour.	Upper jaw.	Teeth carious.	Extraction of carious teeth.
318	Ditto.	Ditto.	Ditto.	Ditto.	Teeth carious.	No operation.
319	Ditto, 1836-7, vol. i., p. 791.	Mr. Pilcher.	Fungous tumour.	Ditto.	Commenced in loosening of molar tooth and swelling of gum after extraction.	——
320	Ditto, p. 403.	Mr. Smart, of Hatton-basket.	Osteo-sarcom. tum.	Lower jaw.	Attributed to cold.	Excision of jaw.
321	Medical Gazette, 1829, vol. v., p. 92.	Mr. Lizars.	Medullary sarcoma.	Upper jaw.	First symptoms, pain in cheek, and discharge of bloody fluid from nose.	Ditto.
322	Lancet, 1829-30, vol. ii., p. 54.	Ditto.	Sarcomat. tumour.	Ditto.	First symptoms, pain and distension.	Ditto.
323	Edinburgh Medical and Surgical Journal, 1828.	Mr. Syme.	Osteo-sarcom. tum.	Lower jaw.	Commenced in swelling of gum on outer side of grinders.	Ditto.
324	Ditto, 1829.	Ditto.	Ditto.	Upper jaw.	——	Ditto.
325	Lancet, 1834-5, vol. ii., p. 612.	Ditto.	Fibro-cartil. tumour.	Ditto.	Commenced in swelling and falling out of teeth, after blow on face.	Ditto.
326	Glasgow Medical Journal, No. v.	Dr. Anderson, of Glasgow.	Fungous tumour.	Ditto.	Supervened on long continued tooth-ache.	Excision of tumour, and cautery.
327	Ditto.	Ditto.	Ditto.	Lower jaw.	Patient the same as in last case. First appeared after extraction of a tooth. Incisor teeth loose; molars on affected side carious; gums constantly oozing a fœtid fluid.	Excision of jaw.
328	Ditto, 1829.	Dr. J. Couper, of Glasgow.	Inflammation and suppuration.	Upper jaw.	Consequent on injury of face. Teeth loose; gums spongy; socket continually oozing pus.	Two molar teeth extracted; perforation of antrum.
329	Medical Gazette, 1837-38, p. 64.	Dr. Lawrie, of Glasgow.	Fibrous tumour.	Lower jaw.	The disease involved alveoli principally. Teeth loose and protruding from ulcerated gums: alveolar processes and cancelli of maxilla softened.	Excision of jaw.

NO.	AUTHORITY.	SURGEON.	DISEASE.	SITUATION.	EARLY SYMPTOMS AND STATE OF MOUTH.	TREATMENT.
330	Medical Gazette, vol. xxx., p. 238.	Mr. J. Douglas, of Glasgow.	Tumour.	Upper jaw.	Commenced in swelling and ulceration of gums; all the grinders on affected side had been extracted. Canine and incisor teeth loose, and on being extracted portions of tumour found adherent to them.	Excision of jaw.
331	Med. Trans. of the College of Physicians, vol. iii., p. 325.	——	Inflammation and suppuration.	Upper jaw.	Carious tooth; diseases consequent on the operation of transplanting a tooth from another person.	No surgical treatment.
332	Surgical Journal of Glasgow Royal Infirmary. 1829.	Dr. Weir.	Fungus hæmatod.	Ditto.	First symptoms, swelling and pain of cheek; teeth carious.	Ditto.
333	Ditto, 1830.	Ditto.	Inflammation, suppuration, with necrosis.	Ditto.	Patient had been salivated.	No treatment.
334	Ditto, 1842.	Mr. Lyon.	Fungous tumour.	Ditto.	Commenced as small tumour over socket of first molar tooth; teeth carious, especially first and second molars of affected side.	No operation.
335	Ditto, ditto.	Ditto.	Sarcomat. tumour.	Ditto.	Commenced in swelling over sockets of several teeth; gums and sockets absorbed.	Excision of tumour, and cautery.

ANALYTICAL TABLE

OF

THE CAUSES OF THE DISEASES OF THE JAWS AS RECORDED IN THE FOREGOING TABLES.

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Alveolar Abscess	3
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Mercurial and Syphilitic Affections of Alveoli	4
Cancer of Lip with Affection of Glands	3
Anormal Growth and Crowding of Teeth	9
Excision of Crown of Tooth and Pivoting	2
Destruction of Dental Pulp	1
Transplanting of the Teeth	2
Retention of Fang after Extraction	2
Retention of Luxated Teeth	2
Injury of Alveolus during Extraction	8
External Violence, Teeth or Gums being unhealthy	4
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